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ICSE CLASS X 2026

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H.C.G. Paper - 2

Time: 2 Hours **Max. Marks: 80**

General Instructions:

1. Answer to this Paper must be written on the paper provided separately.
2. You will not be allowed to write during first 15 minutes.
3. This time is to be spent in reading the question paper.
4. The time given at the head of this Paper is the time allowed for writing the answers.
5. Part I is compulsory. All questions from Part I are to be attempted.
6. A total of five questions are to be attempted from Part II.
7. The intended marks for questions or parts of questions are given in brackets [ ].

PART I

(Attempt all questions from this Part.)

QUESTION 1.

Study the extract of the Survey of India Map Sheet No G43S7 and answer the following questions :

i. (a) What is the social significance of the temple that is found at the six-figure grid reference 362001?
(b) What is the reason for very few settlements in the southeastern quarter of the map extract?

Ans :

(a) The temple has social significance as it is a place of worship where people gather for religious activities and festivals, promoting social interaction and community bonding.
(b) There are very few settlements in the southeastern quarter because the area is likely barren, hilly, or lacks water supply, making it unsuitable for habitation.

ii. (a) What is .3r in grid square 3501?
(b) Identify one relief feature found in the grid square 3796.

Ans :

(a) Relative height of a sand dune is 3 meters.
(b) Ridge (or Spur).

iii. (a) The area shown on the map extract has seasonal streams, but in 3903 a large perennial water source can be seen. What may be the reason for the presence of this large perennial source of water?
(b) Which other source of water seen on the map extract is perennial?

Ans :

(a) The presence of a perennial lined well or a perennial tank which is fed by underground water sources or springs, unlike the seasonal streams that depend on rainfall.
(b) Another perennial source of water seen on the map extract is a well (lined well/tube well).

iv. (a) While travelling for work from Dhaneri (3100) to Marwada (3197) along the metalled road, Sahil crossed over a number of 'causeways'. Why are causeways present in the area shown on the map extract?
(b) Identify the drainage pattern seen in the grid square 3697.

Ans :

(a) Causeways are present because the area has seasonal streams which remain dry for most of the year but get flooded during the rainy season.
(b) Perennial lined wells (indicated by blue circles) or a perennial river (indicated by blue water tint).

v. (a) What is the difference in altitude between the highest point on the map extract and the contour height in grid square 3203?
(b) What is the black horizontal line made between 98 and 99 northings called?

Ans :

(a) Difference
= Height of Highest Point
– Contour Height in Square
1722 – 280 = 1442 meters

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(b) The black horizontal line between 98 and 99 northings is called Line of Latitude.

QUESTION 2.

On the outline map of India provided

i. Mark and name an old fold mountain range of India.

ii. Mark with an arrow and name the river also known as the 'Sorrow of Bihar'.

iii. Shade and label the Gulf of Kutch.

iv. Mark and label the Karakoram Pass.

v. Mark and label an offshore oil field of India.

vi. Shade and label the Laterite soil area in the northeastern part of India.

vii. Mark and name the shared capital city of Punjab and Haryana.

viii. Mark and label the Western Ghats.

ix. Shade and label the river Krishna.

x. Shade and label an area of dense population.

Ans :

i. Old fold mountain range of India — Aravalli Range
ii. River known as the 'Sorrow of Bihar' — Kosi River
iii. Gulf of Kutch — Gulf of Kutch (shade in Gujarat)
iv. Karakoram Pass — Karakoram Pass (in Ladakh region)
v. Offshore oil field — Mumbai High
vi. Laterite soil area (northeastern part of India) — Meghalaya Plateau
vii. Shared capital of Punjab and Haryana — Chandigarh
viii. Western Ghats — Western Ghats (along west coast)
ix. River Krishna — Krishna River
x. Area of dense population — Northern Plains (Indo-Gangetic Plain)

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QUESTION 3.

Choose the correct answers to the questions from the given options.

(Do not copy the questions , write the correct answer only.)

i. Mawsynram, the rainiest place in the world, gets the rain from:
(a) South-west monsoon wind - Arabian Sea branch
(b) South-west monsoon wind - Bay of Bengal branch
(c) Western Disturbance
(d) North-east monsoon wind

Ans :

(b) South-west monsoon wind - Bay of Bengal branch
Mawsynram is located in the Khasi Hills of Meghalaya. The Bay of Bengal branch of the South-West monsoon winds enters the region from the south and gets trapped in the funnel-shaped topography of the Garo, Khasi, and Jaintia hills. This causes the moisture-laden winds to rise abruptly and shed heavy rainfall.

ii. Choose the characteristic that is true about Laterite soil.
(a) It is a clayey soil.
(b) It is moisture retentive.
(c) It is rich in calcium.
(d) It undergoes desilication.

Ans :

(d) It undergoes desilication.
Laterite soil is formed through the process of intense leaching in areas of high temperature and

heavy rainfall. During this process, silica is washed away (a process known as desilication), leaving the soil rich in iron and aluminum oxides. It is typically acidic and has poor moisture retention.

iii. Identify the option which is most similar to:
Tropical Evergreen vegetation : Tall trees and hardwood
(a) Tropical Deciduous vegetation : Pure stands
(b) Tropical Desert vegetation : Small leaves and spines
(c) Coniferous forests : Mountain
(d) Littoral vegetation : Boat making

Ans :

(b) Tropical Desert vegetation : Small leaves and spines
The relationship in the example is "Vegetation Type : Physical Characteristic." Tropical Evergreen forests are known for their height and hardwood. Similarly, Desert vegetation is defined by adaptations like small leaves and spines (to reduce transpiration) and thick stems (to store water).

iv. **Assertion (A) :** Irrigation is practised in large parts of India.
Reason (R) : India has a variety of soil types.
(a) (A) is true and (R) is false.
(b) (A) is false and (R) is true.
(c) Both (A) and (R) are true and (R) is the correct explanation of (A).
(d) Both (A) and (R) are true but (R) is not the correct explanation of (A).

Ans :

(d) Both (A) and (R) are true but (R) is not the correct explanation of (A).
It is true that irrigation is widely practiced in India (Assertion), and it is also true that India has diverse soil types (Reason). However, the primary reason for widespread irrigation is the seasonal and uncertain nature of the Indian monsoon and the high rate of evaporation due to the tropical climate, rather than the variety of soil types.

v. Identify the type of coal that has the highest calorific value.
(a) Peat
(b) Lignite
(c) Bituminous
(d) Anthracite

Ans :

(d) Anthracite
Anthracite is the highest grade of coal. It contains the highest percentage of carbon (over 90%) and the lowest moisture content among all varieties. Because of its high carbon density, it burns with a blue flame, produces very little smoke, and has the highest heating or calorific value.

vi. The residue of _____ forms an important part of the cattle feed and manure.
(a) groundnut
(b) coffee
(c) jute
(d) pulses

Ans :

(a) groundnut
After oil is extracted from groundnuts, the remaining solid residue is known as "oil cake." This cake is highly rich in protein and nutrients, making it an excellent supplement for cattle feed. Additionally, because it is organic and nutrient-dense, it is also widely used as a natural manure to improve soil fertility.

vii. Identify the crop that is grown in the Rabi cropping season.
(a) Sugarcane
(b) Rice
(c) Mustard
(d) Cotton

Ans :

(c) Mustard
The Rabi season begins with the onset of winter in October-November and ends in March-April. Mustard is a temperate oilseed that thrives in these cool, dry conditions. In contrast, Rice and Cotton are primarily Kharif crops that require the heavy rains of the monsoon, while Sugarcane is an annual crop that stays in the field for almost a full year.

viii. Which industry is ideally located close to the raw material producing area?
(a) Silk industry
(b) Jute industry
(c) Cotton textile industry
(d) Sugar industry

Ans :

(d) Sugar industry
The sugar industry is a "weight-losing" industry. Sugarcane is bulky, making it expensive to transport over long distances. More importantly, once harvested, the sucrose content in the cane

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Home Science	Hindi	Robotics and AI	Yoga

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starts to dry up quickly (a process called driage). To ensure the highest sugar recovery, the mills must process the cane within 24 hours of cutting, which is why they are situated in the heart of sugarcane-growing regions.

ix. Which of the following is NOT suitable for composting?
(a) Fruit peels
(b) Egg shells
(c) Neem soap
(d) Used tea leaves

Ans :

(c) Neem soap
Composting is a biological process that breaks down organic, biodegradable waste like fruit peels, egg shells, and tea leaves into nutrient-rich humus. Neem soap, although containing natural neem extracts, often includes synthetic chemicals, fats, or lye that can interfere with the microbial activity in a compost bin or introduce non-organic residues into the soil.

x. The picture given below depicts the use of waterway as a means of transport.

Identify the pair of cities which are most likely to be the terminal cities for the waterway shown in the above picture:
(a) Prayagraj and Haldia
(b) Mumbai and Goa
(c) Chennai and Vishakhapatnam
(d) Kochi and Mangaluru

Ans :

(a) Prayagraj and Haldia
The image depicts a large vessel on an inland riverine waterway. This corresponds to National Waterway 1 (NW-1), which is the most significant inland waterway in India. It runs through the Ganga-Bhagirathi-Hooghly river system and connects the terminal cities of Prayagraj (Uttar Pradesh) and Haldia (West Bengal). The other options represent coastal or sea routes rather than inland river transport.

PART II

(Attempt any five questions from this Part.)

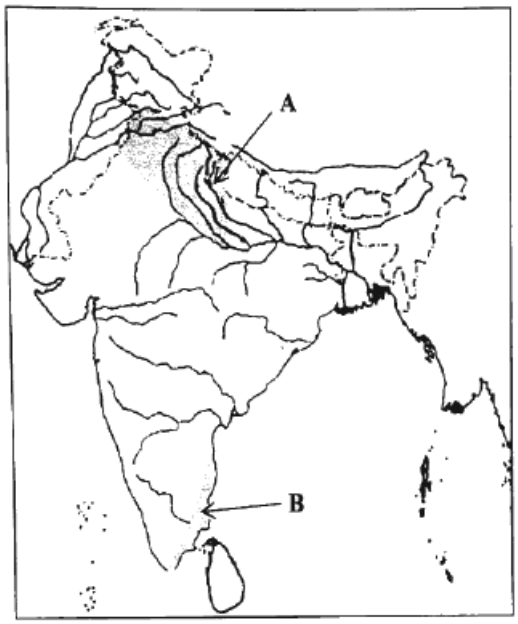
QUESTION 4.

i. (a) Name a state in India which is the first to receive the summer monsoon and is also the last to see its retreat.
(b) Mention the weather conditions experienced during the retreating monsoon season.

Ans :

(a) Kerala
(b) Clear skies, high temperatures, and high humidity.

ii. Study the map showing the area that receives rains during winter and answer the questions that follow:



(a) Name the wind which brings rainfall to:
1. the shaded area labelled A.
2. the shaded area labelled B.
(b) How is the rain brought by the winds named by you in (a) above, beneficial for the area shaded A and the area shaded B?

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Ans :

(a) 1. The winds bringing rainfall to area A are Western Disturbances (temperate cyclones originating from the Mediterranean Sea).
2. The winds bringing rainfall to area B are North-East Monsoon winds (also known as the Retreating Monsoon).

(b) For area A, this light winter rainfall is extremely beneficial for the cultivation of Rabi crops, specifically wheat, as it provides the necessary moisture during the growing season. For area B, this rainfall is the primary source of water for paddy (rice) cultivation and is crucial for filling the irrigation tanks in Tamil Nadu.

iii. Shyam attended winter trekking camps in both Nainital and in Ooty. He observed that the mountains in Nainital were ice-covered, whereas, in Ooty they were ice-free.

(a) As a student of Geography, explain the reason for the difference in climate of Nainital and Ooty?

(b) If Shyam goes to Kochi in the same season, what difference of climate will he experience?

Ans :

(a) The difference is due to latitude and altitude. Nainital is located in the Himalayan region at a higher altitude and in higher latitudes, so it experiences colder temperatures and snowfall. Ooty, though at a high altitude, is located in the tropical southern part of India, so it has a moderate climate and remains ice-free.

(b) In Kochi, Shyam will experience a warm and humid climate because it is a coastal area with maritime influence, leading to equable temperatures and high humidity even in winter.

iv. Study the climate data of station X and answer the following questions:

Month	Temperature (°C)	Rainfall (cm)
Jan	13.5	1.3
Feb	16.8	–
Mar	22.4	–
Apr	33.6	5.9
May	38.6	12.4
June	30.2	43.9
July	29.3	51.4
Aug	28.4	39.8
Sep	27.8	20.9
Oct	25.7	15.1
Nov	19.9	2.6
Dec	15.5	2.1

(a) Why is there a decrease in temperature in the month of June after the high temperature of May?

(b) Calculate the total rainfall of the station during the rainy season and give your answer in cm.

(c) Is station X located near the sea or away from the sea? Give a reason for your answer.

Ans :

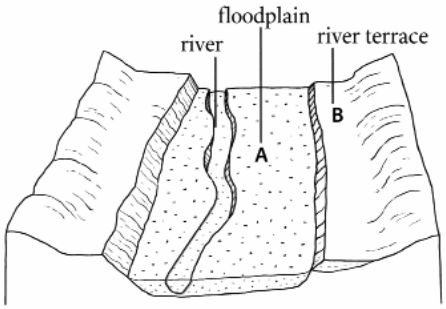
(a) There is a decrease in temperature in June due to the onset of the southwest monsoon, which brings cloud cover and rainfall, lowering the temperature.

(b) In India, the rainy season typically spans from June to September.
Total rainfall during the rainy season:
$43.9 + 51.4 + 39.8 + 20.9 = 156.0$ cm

(c) Station X is located away from the sea because it shows a high range of temperature (continental climate).

QUESTION 5.

i. Observe the picture of ex-situ soil given below and answer the questions that follow:



(a) Identify the types of soil marked as A and B.

(b) Which of the two, A or B, is more fertile and why?

Ans :

(a) The soil types marked are:
1. A: Khadar (New Alluvial soil) – found in the lower floodplains.
2. B: Bangar (Old Alluvial soil) – found in the higher river terraces.

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(b) A is more fertile because it consists of new alluvium deposited by rivers during floods, which is rich in minerals and nutrients, making it highly suitable for agriculture.

ii. (a) Name the soil component derived from the decay of dead plants and animals.
(b) Why is the component mentioned by you in (a) important for agriculture?

Ans :

(a) The soil component is Humus.
(b) Humus is important because it improves soil fertility and helps retain moisture, making the soil suitable for plant growth.

iii. Give a geographical reason to explain each of the following:
(a) In arid regions, trees are planted in rows perpendicular to wind direction.
(b) Black soil does not get leached.
(c) It is difficult to grow rice in red soil without the help of irrigation.

Ans :

(a) Trees are planted perpendicular to wind direction to act as windbreaks and reduce soil erosion by strong winds.
(b) Black soil does not get leached because it is clayey and has high moisture retention capacity, preventing nutrients from being washed away.
(c) Rice requires large amounts of water, but red soil has low water retention capacity, so irrigation is necessary.

iv. (a) What is soil conservation?
(b) Name two areas in north India where soil conservation is required.
(c) Name two methods of soil conservation practised in India.

Ans :

(a) Soil conservation is the protection and proper management of soil to prevent erosion and maintain its fertility.
(b) Punjab and Haryana.
(c) Afforestation and terrace farming.

QUESTION 6.

i. Why are forests important for the Indian economy?

Ans :

Forests are important for the Indian economy because they provide valuable raw materials like timber and fuelwood for industries, and they also support the livelihood of a large number of people, especially in rural areas.

ii. Identify the forest conservation methods described below:
(a) A sustainable system of managing a piece of land through combined production of agricultural crops, forest crops and animal rearing.
(b) Planting of trees along the side of roads, railway lines and on hill slopes.

Ans :

(a) This method is Agro-forestry.
(b) This method is Social Forestry (specifically referred to as Linear Plantation when done along transport lines).

iii. Given below is an image of the forest found in marshy areas. Refer to the image and answer the questions that follow:

(a) Name the type of vegetation seen in the above image.
(b) Mention one adaptive feature of the trees of this vegetation.
(c) Name a region where this type of vegetation is commonly found in India.

Ans :

(a) Mangrove (tidal) forest
(b) Trees have stilt roots/breathing roots (pneumatophores) to survive in waterlogged, marshy soil.
(c) Sundarbans (Ganga–Brahmaputra Delta)

iv. Give one geographical reason to explain each of the following:
(a) Desert vegetation has long roots.
(b) At higher altitudes, trees are often conical in shape.
(c) Tropical Monsoon Forests are also called 'Tropical Deciduous Forests'.

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Ans :

(a) Desert vegetation has long roots to reach deep underground water due to scarcity of surface water.
(b) Trees are conical in shape at higher altitudes to allow snow to slide off easily and prevent accumulation.
(c) Tropical Monsoon Forests are called Tropical Deciduous Forests because they shed their leaves during the dry season to conserve water.

QUESTION 7.

i. Raghu wants to irrigate his large field in a manner that will ensure uniform water distribution across the field along with water conservation.
(a) Name the irrigation method that will be suitable as per his need.
(b) How will the method of irrigation mentioned by you in (a) above help to conserve water?

Ans :

(a) The most suitable method is sprinkler irrigation.
(b) Sprinkler irrigation helps to conserve water because it supplies water in a controlled and uniform manner, reducing loss of water through runoff and evaporation, and ensuring that only the required amount of water is used.

ii. What is the difference between Inundation canals and Perennial canals?

Ans :

The difference between Inundation canals and Perennial canals are as follows :

Inundation Canals	**Perennial Canals**
Get water only during floods (rainy season)	Get water throughout the year
Taken from rivers without dams/barrages	Taken from rivers with dams/barrages

iii. Considering the rapid depletion of groundwater and its implications for food and water security in India, sustainable management of groundwater resources is needed.
Source: [Journal of Hydrology, Volume 596, May 2021]
(a) How is 'groundwater' different from 'surface water'?
(b) Why is the groundwater level rapidly declining in India?
(c) Name one conservation measure that will help in recharging of the groundwater.

Ans :

(a) Groundwater is water stored below the Earth's surface in soil and rock layers (aquifers), whereas surface water is found on the Earth's surface in rivers, lakes, and reservoirs.
(b) The groundwater level is declining rapidly due to:
1. Over-extraction for irrigation, especially for water-intensive crops like paddy and sugarcane
2. Increasing demand due to population growth and urbanisation
3. Deforestation, which reduces infiltration and groundwater recharge
(c) One conservation measure is rainwater harvesting, which helps recharge groundwater by allowing rainwater to percolate into the soil and replenish aquifers.

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iv. Give a reason for each of the following:
(a) Wells are a common means of irrigation in Northern India.
(b) Many state governments have restricted the use of tubewells.
(c) Tank irrigation is a popular method of irrigation used in Karnataka.

Ans :

(a) Wells are common in Northern India because the region has soft alluvial soil which is easy to dig and a high water table due to perennial rivers.
(b) Many state governments have restricted tubewells to prevent over-exploitation of groundwater, which leads to a fall in the water table.
(c) Tank irrigation is popular in Karnataka because the hard, rocky terrain of the Deccan Plateau makes well and canal irrigation difficult, while natural depressions help store rainwater in tanks.

QUESTION 8.

i. State two advantages that Natural gas has over Coal.

Ans :

1. Cleaner Energy: Natural gas is more environmentally friendly as it produces significantly lower carbon dioxide and pollutant emissions compared to coal.

2. Ease of Transport: It is more economical and efficient to transport over long distances via pipelines, whereas coal requires heavy rail or road transport.

ii. (a) Umesh and Sagar are employed in iron ore mines in two different districts of Odisha. What are their possible places of work?
(b) State any two uses of copper.

Ans :

(a) Their possible places of work are the Mayurbhanj and Keonjhar (Kendujhar) districts, which are the leading iron ore producing regions in Odisha.
(b) Uses of Copper:
1. Electrical Industry: Due to its high conductivity, it is used extensively for making electrical wires, motors, and transformers.
2. Alloys: It is used as a base metal to create important alloys like Brass (copper and zinc) and Bronze (copper and tin).

iii. (a) The Bhakra Nangal project is a joint venture of which state governments?
(b) Name the river on which this project is based.
(c) Mention two benefits of the Bhakra Nangal project.

Ans :

(a) It is a joint venture of the state governments of Punjab, Haryana, and Rajasthan.
(b) The project is built across the Sutlej River.
(c) Benefits:
1. Irrigation: It provides water to millions of hectares of agricultural land, which was crucial for the success of the Green Revolution.
2. Hydroelectric Power: It generates a vast amount of electricity that powers industries and homes across Northern India.

iv. Give one word for each of the following:
(a) The renewable energy produced by the natural rise and fall of ocean waters.
(b) An ore of aluminium.
(c) A mineral that is used to make steel strong and resistant to rusting.

Ans :

(a) Tidal energy
(b) Bauxite
(c) Manganese

QUESTION 9.

i. Differentiate between subsistence farming and commercial farming.

Ans :

The difference between subsistence farming and commercial farming are as follows

Feature	**Subsistence Farming**	**Commercial Farming**
Objective	Produced mainly for the farmer's own consumption.	Produced for sale in the market for profit.
Farm Size	Small and fragmented land holdings.	Large land holdings (estates or plantations).
Methods	Uses traditional tools and manual labor.	Uses modern machinery, HYV seeds, and fertilizers.

ii. (a) Name a state that leads in the production of jute.
(b) Mention a geographical factor that is responsible for the state mentioned in (a) above being the leading producer of jute.

Ans :

(a) West Bengal
(b) The presence of the Ganga-Brahmaputra Delta provides fertile, loamy alluvial soil that is renewed every year by silt brought down by floods. This, combined with the hot and humid climate and abundant water from the river Hooghly for retting, makes it the ideal location.

iii. (a) Why are Silver Oak trees and Cardamom trees planted in coffee plantations along with the coffee plants?
(b) State two climatic conditions that favour the cultivation of coffee.

Ans :

(a) Silver Oak and Cardamom trees are planted in coffee plantations to provide shade, as coffee plants grow best under shaded conditions.
(b) Climatic conditions are as follows :
1. Temperature: A warm climate with temperatures between 15°C and 28°C.
2. Rainfall: Heavy rainfall ranging from 150 cm to 250 cm, well-distributed throughout the year.

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iv. (a) Name the cropping season in which Bajra is grown.
(b) Why is wheat not cultivated extensively in West Bengal and the extreme southern states of India?
(c) Why is the cultivation of soyabean gaining popularity in recent times?

Ans :

(a) Kharif season.
(b) Wheat is not cultivated extensively in these regions because they have a hot and humid climate, whereas wheat requires a cool and dry climate for proper growth..
(c) The cultivation of soyabean is gaining popularity because it is a high-yielding crop rich in protein and oil, and has a high demand in both domestic and international markets.

QUESTION 10.

i. 'Not all areas of India are suitable for establishing a large-scale industry.' Give two reasons for the above statement.

Ans :

1. Uneven availability of raw materials and power – Many areas lack adequate resources needed for industries.
2. Poor transport and infrastructure – Some regions do not have proper roads, railways, or communication facilities.

ii. 'The contribution of the electronics industry is crucial for the progress and development of the Indian economy.' State two arguments in favour of this statement.

Ans :

1. Massive Employment: It is a major job creator, providing opportunities for millions in manufacturing, hardware design, and software services, supporting the "Make in India" initiative.
2. Digitization and Efficiency: The industry drives technological advancement across other sectors like telecommunications, defense, and healthcare, increasing national productivity through automation and digital services.

iii. Give one geographical reason to explain each of the following:
(a) Work in sugar mills is a seasonal activity.
(b) The cotton textile industry is widely distributed in India.
(c) Vishakhapatnam steel plant has a unique locational advantage that enables it to procure raw materials easily and market the finished products with ease.

Ans :

(a) Sugar mills depend on sugarcane which is harvested only in a particular season, so work is seasonal.
(b) The cotton textile industry is widely distributed because raw material (cotton) is available in many parts of India.
(c) Vishakhapatnam steel plant is located near a port, which facilitates easy import of raw materials and export of finished goods.

iv. (a) Name the oldest iron and steel industry of India.
(b) Where is it located?
(c) Name a centre from where it gets its coal supply.

Ans :

(a) The Tata Iron and Steel Company (TISCO).
(b) It is located at Jamshedpur in Jharkhand.
(c) It gets its coal supply from the Jharia coalfields

QUESTION 11.

i. Inland water transport is more popular in Northern India as compared to Peninsular India. Give two reasons.

Ans :

1. Northern India has perennial rivers (like the Ganga and Brahmaputra) which are deep and navigable throughout the year.
2. Peninsular rivers are seasonal, shallow, and flow over rocky terrain, making navigation difficult.

ii. What is the purpose of developing the Golden Quadrilateral in India?

Ans :

The Golden Quadrilateral was developed to connect the four major metropolitan cities—Delhi, Mumbai, Chennai, and Kolkata and to facilitate faster movement of goods and passengers, thereby promoting trade and economic development.

iii. Mr. Kumar stays in Delhi with his family. Members of his family had to travel on Monday for different purposes. State the mode of transport that is most likely to be chosen by each:

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(a) Mr. Kumar's father wanted to travel comfortably to Patna to stay with his brother for a week.
(b) Mr. Kumar's son had to attend a meeting in Ahmedabad that very evening.
(c) Mr. Kumar's daughter had to meet her friend who lives in the same city, taking with her some fresh vegetables grown in their kitchen garden.

Ans :

(a) Railways
(b) Airways
(c) Roadways

iv. Give one geographical reason to explain each of the following:
(a) The presence of a number of ports has strengthened the transport sector of India.
(b) The number of airports in the country is on the rise.
(c) Railways are considered ideal for transportation of bulky goods over long distances.

Sol :

(a) Ports facilitate import and export trade, improving connectivity with other countries and strengthening transport.
(b) Increasing demand for faster travel and air connectivity has led to a rise in the number of airports.
(c) Railways can carry large quantities of heavy and bulky goods economically over long distances.

QUESTION 12.

i. What impact does waste accumulation have on our environment?

Ans :

Waste accumulation leads to land degradation and soil pollution. It contaminates groundwater through a process called leaching, where toxic liquids from the waste seep into the earth. Furthermore, rotting waste releases foul odors and greenhouse gases like methane, while also serving as a breeding ground for disease-carrying vectors like flies and rats.

ii. Study the picture given below and answer the questions that follow:

(a) Name the waste management practice shown in the given picture.
(b) State two benefits of this waste management practice.

Ans :

(a) The waste management practice shown is Composting.
(b) Two benefits are as follows :
1. It converts organic waste into nutrient-rich manure, improving soil fertility.
2. It helps in reducing the amount of waste going to landfills, thus lowering pollution.

iii. Udit wants his younger sister to bring about a few lifestyle changes to help her contribute towards a cleaner and healthier environment. Suggest three advice that Udit may provide her in this regard.

Ans :

1. She should segregate waste and follow the 3Rs (Reduce, Reuse, Recycle) to minimize environmental pollution.
2. She should avoid single-use plastics and switch to reusable, eco-friendly products like cloth bags and steel bottles.
3. She should conserve natural resources by saving water and electricity and using public transport or walking whenever possible.

iv. Give a reason for each of the following:
(a) Waste should be segregated before disposal.
(b) Dumping could be harmful for the environment.
(c) Radioactive waste is the most harmful waste.

Ans :

(a) Waste should be segregated to enable recycling and proper disposal of different types of waste.
(b) Dumping causes land, air and water pollution and can spread diseases.
(c) Radioactive waste emits harmful radiation which can cause serious health hazards and environmental damage.

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ICSE CLASS X 2025

GEOGRAPHY

H.C.G. Paper - 2

Time: 2 Hours **Max. Marks: 80**

General Instructions:

1. Answer to this Paper must be written on the paper provided separately.
2. You will not be allowed to write during first 15 minutes.
3. This time is to be spent in reading the question paper.
4. The time given at the head of this Paper is the time allowed for writing the answers.
5. Part I is compulsory. All questions from Part I are to be attempted. A total of five questions are to be attempted from Part II.
6. The intended marks for questions or parts of questions are given in brackets [ ].

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PART I

(Attempt all questions from this Part.)

QUESTION 1.

1. Study the extract of the Survey of India Map Sheet No. G43S7 and answer the following questions.

(i) (a) Give the six-figure grid reference for spot height .437 in the southeastern part of the map extract. -

(b) A man, a local craftsman, wants to sell his product to a large gathering to earn money instantly.

1. Which settlement should he go to
2. Name the month in which he should visit the settlement named by you above.

(ii) (a) On which bank of the Sukli nadi is the settlement of Pamera situated

(b) Identify the settlement pattern seen in the grid square 6732.

(iii) Roshan, while travelling from Sirori to Tokra, observed that the surface water sources are dry except for the reservoir near Tokra.

(a) What according to you may be the reason for the presence of water in the reservoir in 6832 near Tokra settlement.

(b) State whether this reservoir is artificial or notioral source of water

(iv) (a) "What is the direct distance between Gulabganj to Pithapura? Give your answer in kilometre.

(b) Mention the compass direction of Pithapuafrom Gulabganj.

(v) (a) Name two man made features seen in the grid square 6534.

(b) Define contour interval.

Ans :

(i) (a) 677311

(b) 1. Gulabganj

2. February

(ii) (a) Right bank

(b) Compact/Nucleated

(iii) (a) The reservoir is storing water from the Sukli Nadi, ensuring a constant water supply even when other sources are dry.

(b) Artificial

(iv) (a) 2.25 km

(b) South

(v) (a) Metalled Road and Settlement

(b) The contour interval is the vertical distance between adjacent contour lines on a map.

QUESTION 2.

2. On the outline map of India provided :

(i) Mark and label the Nathu-La pass.

(ii) Shade and name the coastal plain that occupies a large part of Kerala.

(iii) Mark and label Digboi.

(iv) Mark and label Chilka lake.

(v) Mark with arrows and name the wind that brings rainfall to Tamil Nadu coast during winter.

(vi) Mark and label the river Sutlej.

(vii) Mark and label the Standard Meridian of India.

(viii) Mark and label Satpura range.

(ix) Shade and label the Chota Nagpur plateau.

(x) Mark and label Visakhapamam.

Ans :

QUESTION 3.

3. Choose the correct answers to the questions from the given options.
(Do not copy the questions, write the correct answers only.)

(i) **Assertion(A) :** Mumbai receives more rainfall than Pune.
Reason(R) : Mumbai gets rain from Arabian Sea branch of southwest monsoon.
(a) Both (A) and (R) are true and (R) is the correct explanation for (A).
(b) Both (A) and (R) are true and (R) is not the correct explanation for (A).
(c) (A) is true and (R) is false.
(d) (A) is false and (R) is true.

Ans :

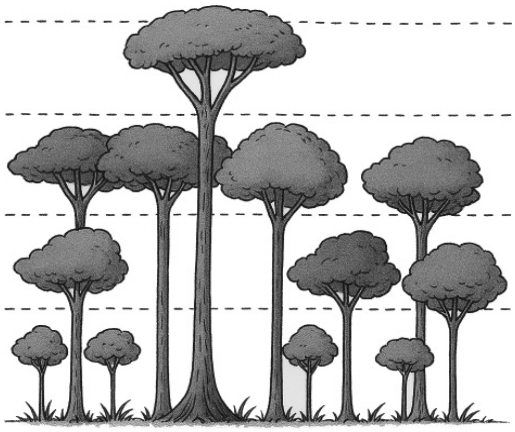
(a) Both (A) and (R) are true, and (R) is the correct explanation for (A).
Mumbai receives more rainfall than Pune because it is on the windward side of the Western Ghats, where moisture-laden winds from the Arabian Sea branch of the southwest monsoon cause heavy rainfall. Pune, on the leeward side, gets much less rainfall due to the rain shadow effect.

(ii) Which of the following pairs of soils displays similar characteristics in terms of their colour and texture?
(a) Alluvial soil and laterite soil
(b) Black soil and red soil
(c) Red soil and laterite soil
(d) Alluvial soil and black soil

Ans :

(c) Red soil and laterite soil
Both red and laterite soils have a reddish color due to the presence of iron oxides. They are usually found in regions with high temperatures and heavy rainfall. These soils are generally less fertile due to leaching, but they can support crops like millets, pulses, and tea with proper fertilization.

(iii) The type of natural vegetation shown in the picture given below is found in :



(a) Tropical desert
(b) Tropical deciduous
(c) Tropical evergreen
(d) Littoral forest

Ans :

(c) Tropical evergreen
These forests are commonly found in areas such as the Western Ghats, Northeast India, and the Andaman and Nicobar Islands in India. The trees in these forests do not shed all their leaves at the same time, giving them an evergreen appearance.

(iv) Which of the following prevents wastage of water?
(a) Canal
(b) Well
(c) Sprinkler
(d) Tube well

Ans :

(c) Sprinkler
Sprinkler irrigation helps prevent water wastage by delivering water directly to plants in a controlled manner, minimizing evaporation and runoff. This method is particularly useful in regions with uneven terrain or limited water supply, ensuring better water management for agriculture.

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(v) Balaghat: Manganese:: Mumbai High:
(a) Copper
(b) Coal
(c) Iron Ore
(d) Petroleum

Ans :

(d) Petroleum
Mumbai High is India's largest offshore oil field, producing petroleum, just as Balaghat in Madhya Pradesh is an important source of manganese. Petroleum extracted from Mumbai High is refined and used in fuel production, supporting India's energy needs.

(vi) A microbiological process that loosens the bark of a crop and facilitates removal of fibre from the stalk :
(a) Rolling
(b) Ratooning
(c) Retting
(d) Fermentation

Ans :

(c) Retting
Retting is a microbial process used to extract fibres from plants like jute, flax, and hemp. Microorganisms break down the pectin that binds fibres to the stem, making it easier to separate them. This process is usually done by soaking the plant stalks in water for a few days.

(vii) Which industry amongst the following has revolutionized the lifestyle of the Indian masses in recent years?
(a) Cotton Textile
(b) Electronic
(c) Iron and Steel
(d) Sugar

Ans :

(b) Electronic
The electronic industry has drastically transformed the lifestyle of Indian masses, with mobile phones, computers, and smart home appliances becoming household essentials. This industry has contributed to faster communication, improved convenience, and digital advancements in various sectors, including banking and education.

(viii) Which of the following household products is associated with the petrochemical industry?
(a) Glass bottle
(b) Wooden chopping board
(c) Kitchen knife
(d) Plastic mug

Ans :

(d) Plastic mug
Plastic products, including mugs, containers, and bottles, are derived from petrochemicals such as polyethylene and polypropylene. The petrochemical industry refines crude oil to produce plastic, which is widely used due to its durability, lightweight nature, and cost-effectiveness.

(ix) Raman, a dairy farmer in Ludhiana, supplies milk within the city on a daily basis. Which mode of transport is he most likely to use?
(a) Railway
(b) Roadway
(c) Airway
(d) Waterway

Ans :

(b) Roadway
Road transport is the most efficient mode for transporting perishable goods like milk within a city. It ensures quick and flexible delivery to different locations, which is essential for dairy farmers like Raman to maintain freshness and meet daily demand.

(x) The collection of discarded materials and converting them into useful products is :
(a) Recycling
(b) Processing
(c) Reducing
(d) Compo sting

Ans :

(a) Recycling
Recycling involves collecting discarded materials like paper, plastic, glass, and metal and processing them to create new products. This reduces environmental pollution, conserves natural resources, and promotes sustainable waste management practices.

PART II

(Attempt any five questions from this Part.)

QUESTION 4.

(i) Severe cyclonic storms are of ten formed over the Bay of Bengal during the retreating monsoon season.

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(a) Name two states that are affected by tropical cyclones on the eastern coast of India.
(b) The temperate cyclones cause less damage than the tropical cyclones. Give any two points to support this statement.

(ii) (a) Name the local wind that causes rainfall in the states of Assam and West Bengal in the month of April.
(b) How is this rainfall beneficial for the states mentioned above?

(iii) With reference to Figure A and B given below, answer the questions that follow :

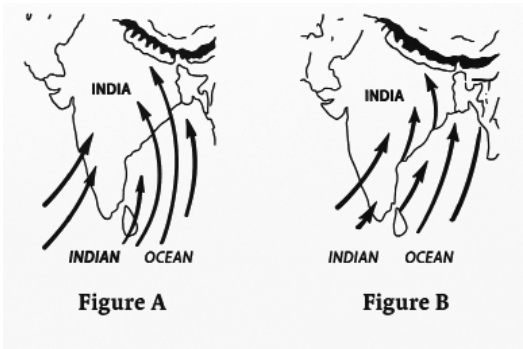

Figure A Figure B

(a) Name the winds shown by arrows in Figure A and Figure B.
(b) How is the wind shown in Figure A different from the one shown in Figure B?

(iv) Study the climate data of station X and answer the following questions :

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Temp (°C)	24.0	25.4	26.7	28.3	30.0	28.9	27.6	27.4	27.3	27.1	27.0	25.0
Rainfall (cm)	0.25	0.25	-	-	1.75	50.2	61.0	37.0	27.0	4.75	1.50	

(a) What is the annual range of temperature for station X?
(b) Which is the wettest month?
(c) Name the wind which brings rainfall for station X during the rainy season.

Ans :

(i) (a) Two states affected by tropical cyclones on the eastern coast of India are West Bengal and Odisha.
(b) Temperate cyclones cause less damage than tropical cyclones because :
1. Lower Wind Speeds – Temperate cyclones generally have lower wind speeds (40-120 km/h) compared to tropical cyclones, which can exceed 200 km/h, leading to less destruction.
2. Weaker Storm Surges – Unlike tropical cyclones, temperate cyclones do not generate massive storm surges, reducing the risk of coastal flooding.

(ii) (a) The local wind that causes rainfall in Assam and West Bengal in April is called Kalbaisakhi or Nor'westers.
(b) This rainfall is beneficial because it provides much-needed moisture for the cultivation of jute and rice, which are major crops in Assam and West Bengal. It also helps in reducing the summer heat and replenishing water sources.

(iii) (a) The winds shown by arrows in Figure A represent the Southwest Monsoon Winds (summer monsoon). The winds shown by arrows in Figure B represent the Northeast Monsoon Winds (winter monsoon).
(b) Differences between the winds in Figure A and Figure B :
1. Direction : Figure A : Winds blow from the Indian Ocean towards the Indian subcontinent (southwest to northeast). Figure B : Winds blow from the landmass of India towards the Indian Ocean (northeast to southwest).
2. Moisture Content and Rainfall : Figure A : Southwest monsoon winds carry moisture-laden winds from the ocean, causing heavy rainfall in most parts of India. Figure B : Northeast monsoon winds are dry as they originate from the land, causing little rainfall, except in the Coromandel Coast (Tamil Nadu), where they pick up moisture from the Bay of Bengal.

(iv) (a) Annual Range of Temperature = Highest temperature - Lowest temperature
Highest temperature = 30.0°C (May)
Lowest temperature = 24.0°C (January)
Annual range = 30.0°C - 24.0°C = 6.0°C
(b) The wettest month is July, with 61.0 cm of rainfall.
(c) The wind that brings rainfall for station X during the rainy season is the Southwest Monsoon Winds.

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QUESTION 5.

(i) The Ganga Plain is known for its fertile soil. It is often referred to as the food bowl of India. This region supports a variety of crops such as rice,

wheat, pulses, jute and sugarcane.
(a) Name the soil that is found in large parts of Ganga plain.
(b) Give two properties of this soil which helps it to produce a variety of crops.

(ii) (a) What is meant by soil erosion?
(b) Name any two agents of soil erosion.

(iii) Give a geographical reason to explain each of the following :
(a) Soil conservation is the need of the hour.
(b) Red soil has a poor water retention capacity.
(c) Laterite soils are infertile.

(iv) With reference to black soil of India, answer the following questions.
(a) How is this soil formed?
(b) How is this soil able to retain moisture for a long period?
(c) Mention any two minerals present in this soil.

Ans :

(i) (a) The Alluvial Soil is found in large parts of the Ganga Plain.
(b) Two properties of alluvial soil that help in producing a variety of crops :
1. High Fertility : It is rich in minerals like potash, phosphoric acid, and lime, making it ideal for cultivation.
2. Moisture Retention : The soil has good moisture-retaining capacity, which supports the growth of crops like rice and wheat.

(ii) (a) Soil erosion is the removal of the top fertile layer of soil by natural forces like wind, water, and human activities.
(b) Two agents of soil erosion :
1. Wind – It blows away loose topsoil in dry and arid regions.
2. Water – Heavy rainfall and fast-flowing rivers wash away the soil.

(iii) (a) Soil conservation is the need of the hour because soil erosion reduces fertility, leading to lower agricultural productivity and environmental degradation.
(b) Red soil has poor water retention capacity because it is rich in iron but lacks humus and clay, making it porous and less capable of holding water.
(c) Laterite soils are infertile because they are heavily leached due to excessive rainfall, which washes away essential nutrients like nitrogen and potassium.

(iv) (a) Formation : Black soil is formed from the weathering of basaltic rocks, mainly found in the Deccan Plateau.
(b) Moisture Retention : It has a high clay content, which enables it to absorb and retain moisture for a long time, even during dry periods.
(c) Two minerals present in black soil :
1. Calcium carbonate
2. Magnesium

QUESTION 6.

(i) India has lost 2.33 million hectares of tree cover since the year 2000. This is equivalent to a six percent decrease in tree cover during this period.
Source : The Indian Express, Date : 12.04.2024
(a) Mention any two causes of the decrease in the forest cover of India.
(b) Name a conservation method that may be used to help in increasing the forest cover of india .

(ii) Mention the climatic condition suitable for the development of tropical evergreen forest.

(iii) State any three differences between tropical deciduous and tropical desert vegetation.

(iv) (a) Give any two reasons for the great diversity of natural vegetation in India.
(b) How do the forests help in maintenance of air quality?

Ans :

(i) (a) Two causes of the decrease in forest cover in India :
1. Deforestation for agriculture and urbanization – Expanding farmland and growing cities lead to large-scale clearing of forests.
2. Illegal logging and industrial activities – Overexploiting of trees for timber, paper, and industries reduces forest cover.
(b) Afforestation and reforestation help restore forest cover by planting trees in deforested or barren areas.

(ii) Climatic conditions suitable for the development of tropical evergreen forests :
(a) High temperature (above 25°C) throughout the year
(b) Heavy and well-distributed rainfall (more than 200 cm annually)
(c) High humidity (above 75%)

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(iii) Differences Between Tropical Deciduous and Tropical Desert Vegetation

Feature	Tropical Deciduous Forests	Tropical Desert Vegetation
Location	Found in central and eastern India (e.g., Madhya Pradesh, Chhattisgarh)	Found in arid regions like Rajasthan and Gujarat
Rainfall	Moderate rainfall (100–200 cm per year)	Very low rainfall (less than 50 cm per year)
Vegetation Type	Trees shed leaves in dry season to conserve water	Plants have thorns, deep roots, and store water (e.g., cacti)

(iv) (a) Two reasons for the great diversity of natural vegetation in India :
1. Varied Climate : Different temperature and rainfall patterns across the country support diverse vegetation types.
2. Diverse Topography : India has mountains, plateaus, plains, and coastal areas, each supporting unique plant life.

(b) Forests help in maintaining air quality by following ways:
1. Forests absorb carbon dioxide and release oxygen through photosynthesis, reducing air pollution.
2. They trap dust and pollutants on leaves, improving air quality.
3. Forests increase humidity and regulate temperature, contributing to better atmospheric conditions.

QUESTION 7.

(i) Mention any one advantage and any one disadvantage of well irrigation.

(ii) Suggest any two measures to overcome scarcity of water in the metropolitan cities of India.

(iii) Give one reason to explain each of the following :
(a) Tank irrigation is NOT common in Northern India.
(b) Canal irrigation is important in Punjab.
(c) All farmers do not use tube well irrigation even if the geographical condition is favorable.

(iv) State any three objectives of rainwater harvesting.

Ans :

(i) Advantage and disadvantage of Well Irrigation
(a) Advantage : It is a cheap and independent source of water supply for small farmers.
(b) Disadvantage : It is not suitable for areas with low groundwater levels or saline water.

(ii) Two Measures to Overcome Water Scarcity in Metropolitan Cities
1. Rainwater Harvesting – Collecting and storing rainwater for household and industrial use.
2. Wastewater Recycling – Treating and reusing wastewater for non-drinking purposes like irrigation and cleaning.

(iii) (a) Tank irrigation is NOT common in Northern India because the region has few natural depressions to store water and a well-developed river system.
(b) Canal irrigation is important in Punjab because the region has flat terrain and perennial rivers, making it ideal for canal construction.
(c) All farmers do not use tube well irrigation even if conditions are favorable because it requires high installation and operational costs, including electricity or diesel.

(iv) Three objectives of Rainwater Harvesting
(a) To conserve water and reduce dependence on groundwater.
(b) To recharge underground water tables and prevent depletion.
(c) To reduce urban flooding by storing excess rainwater.

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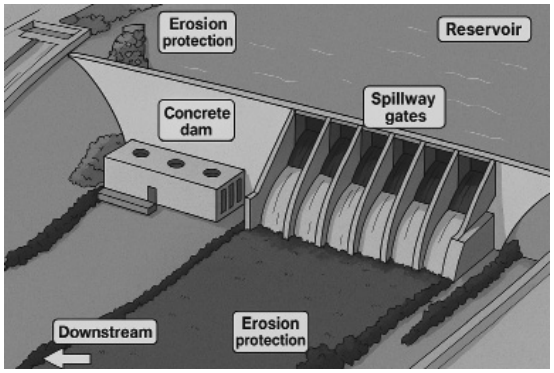
QUESTION 8.

(i) With the rising price of fossil fuel every passing day, it is very important to develop non-conventional energy resource.
Bulletin Department of non-conventional sources of energy
(a) Name a non-conventional energy source that can be harnessed by taking advantage of India's vast coastline.
(b) State one advantage of using geothermal energy.

(ii) (a) How is Biogas formed?
(b) Mention any one advantage of Biogas over other non-conventional energy resources.

(iii) Give a reason for each of the following.
(a) Iron ore is called a versatile mineral.
(b) Windmills set up on agricultural lands are beneficial to framers.
(c) Coal is the most preferred source of energy in indian industries.

(iv)



(a) Identify the type of energy being generated in the picture given above.
(b) State why this type of energy is cheaper in the long run.
(c) Name a power project associated with the generation of this energy in the northern part of India.

Ans :

(i) (a) Tidal Energy can be harnessed using India's vast coastline to generate electricity.
(b) One Advantage of Geothermal Energy : It is a renewable and eco-friendly source that provides continuous energy without polluting the environment.

(ii) (a) Formation of Biogas : Biogas is formed by the anaerobic decomposition of organic waste like animal dung, plant matter, and kitchen waste by bacteria in the absence of oxygen.
(b) One advantage of Biogas over other non-conventional energy sources: It produces both energy (methane) and organic fertilizer (slurry), making it highly useful for rural areas.

(iii) (a) Iron ore is called a versatile mineral because it is used in various industries like construction, transportation, machinery, and infrastructure.
(b) Windmills set up on agricultural lands are beneficial to farmers as they generate electricity while allowing farming activities to continue on the same land.
(c) Coal is the most preferred source of energy in Indian industries because it is abundantly available, cost-effective, and provides a continuous power supply.

(iv) (a) The type of energy being generated in the picture is Hydroelectric Energy.
(b) Hydroelectric energy is cheaper in the long run because :
1. It does not require fuel, reducing operational costs.
2. It has low maintenance expenses compared to thermal or nuclear power plants.
3. Dams have a long lifespan, providing electricity for decades.
(c) A power project associated with hydroelectric energy in northern India is the Bhakra Nangal Dam (on the Sutlej River).

QUESTION 9.

(i) Mention two climatic conditions that favour the cultivation of groundnut.

(ii) Give any two reasons why Maharashtra has emerged as an important sugarcane producing state.

(iii) Give one reason to explain each of the following :
(a) Trees are planted in between the rows of coffee plants.
(b) Cotton cultivation requires plenty of cheap labour.
(c) Hill slopes are best suited for tea cultivation.

(iv) Explain the following :
(a) Mixed farming
(b) Zayad
(c) Transplantation

Ans :

(i) Two climatic conditions that favor groundnut cultivation :
(a) Warm temperature (20°C – 30°C) during the growing period.
(b) Moderate rainfall (50–75 cm), well-distributed and followed by dry conditions at harvest.

(ii) Two reasons why Maharashtra is an important sugarcane-producing state :
(a) Black soil and favorable climate – The region has well-drained black soil and moderate rainfall, ideal for sugarcane growth.

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(b) Well-developed irrigation facilities – Canals and tube wells ensure continuous water supply, even in dry seasons.

(iii) (a) Trees are planted between rows of coffee plants to provide shade and regulate temperature, protecting delicate coffee plants from excessive heat.

(b) Cotton cultivation requires plenty of cheap labor because it involves labor-intensive processes like sowing, weeding, picking, and ginning.

(c) Hill slopes are best suited for tea cultivation as they prevent waterlogging, ensure proper drainage, and provide cool, humid conditions ideal for tea growth.

(iv) (a) Mixed Farming : A farming system where crops and livestock are raised together on the same farm to improve productivity and soil fertility.

(b) Zayad : A short-season summer crop grown between Rabi and Kharif seasons (March to June), e.g., watermelon, cucumber, and muskmelon.

(c) Transplantation : A method where young seedlings are first grown in nurseries and then transferred to the main field for better growth (commonly used in rice cultivation).

QUESTION 10.

(i) State any two factors that are responsible for the growth of the cotton textile industry in Kolkata.

(ii) 'Karnataka is the leading state for silk production in India. Give any two reasons to justify the above statement.

(iii) (a) Name the Iron and Steel industry located at Chhattisgarh.

(b) From where does the industry named by you above get its supply of the following?

1. Iron ore
2. Coal

(iv) Raghav has been given a project by his teacher in which he has to write about the by-products of an industry that is used for preparing shoe polish, carbon paper and cardboard.

(a) Which industry will he be writing about?

(b) Name any two by-products of the industry mentioned by you.

Ans :

(i) Two factors responsible for its growth :

(a) Port Facility : Kolkata has a major port (Kolkata Port), making it easy to import raw cotton and export finished goods.

(b) Cheap and Skilled Labor : The city has a large workforce, ensuring a steady supply of skilled and low-cost labor.

(ii) Two reasons why Karnataka is the leading silk-producing state :

(a) Ideal Climate : Moderate temperature and humidity favor mulberry cultivation, essential for silkworms.

(b) Well-Developed Sericulture Industry : Government support, research centers, and skilled farmers promote silk production.

(iii) (a) The Bhilai Steel Plant is located in Chhattisgarh.

(b) Sources of raw materials :

1. Iron ore – Supplied from Dalli-Rajhara mines (Chhattisgarh).
2. Coal – Sourced from Korba coalfields (Chhattisgarh).

(iv) (a) Raghav will write about the Petroleum Industry (or Oil Refining Industry).

(b) Two by-products :

1. Paraffin wax – Used in shoe polish and carbon paper.
2. Bitumen – Used in cardboard and road construction.

QUESTION 11.

(i) Why is a well-developed transport network important for India?

(ii) Mention any two advantages of road transport.

(iii) Name the following :

(a) The mode of transport that ensures comfortable journey, especially for elders and children.

(b) The highway connecting Silchar in Assam to Porbandar in Gujarat

(c) The cheapest means of transport for bulky goods.

(iv) Give a reason for each of the following.

(a) Airways are the most efficient mode of transport to connect Northeast India with the rest of the country.

(b) Railways are easily developed in the Northern Plains of India.

(c) Rivers of peninsular India are NOT ideal for inland water transport.

Ans :

(i) Importance of a Well-Developed Transport Network for India: A well-developed transport network is crucial for India's economic growth, as it facilitates trade, connectivity, and industrial development, ensuring the efficient movement of people and goods across the country.

(ii) Two Advantages of Road Transport
(a) Door-to-Door Service : Roads provide direct access to remote areas, unlike railways or waterways.
(b) Cost-Effective for Short Distances : Road transport is cheaper and more flexible for transporting goods and passengers over short distances.

(iii) (a) Railways – Ensures a comfortable journey for elders and children due to its smooth travel experience.
(b) East-West Corridor – The highway connecting Silchar (Assam) to Porbandar (Gujarat).
(c) Waterways – The cheapest means of transport for bulky goods like coal and iron ore.

(iv) (a) Airways are the most efficient mode of transport for Northeast India because the region has dense forests, hilly terrain, and frequent floods, making road and rail connectivity difficult.
(b) Railways are easily developed in the Northern Plains because the land is flat and fertile, making railway construction easier and more cost-effective.
(c) Rivers of Peninsular India are NOT ideal for inland water transport as they are seasonal, have uneven flow, and contain waterfalls/rapids, making navigation difficult.

QUESTION 12.

(i) (a) Give a reason for a substantial rise of E-waste in India.
(b) What is dumping?

(ii) 'You cannot protect environment unless you empower people, you inform them and help them to understand that these resources are their own, that they must protect them."
Wangari Maathai (recipient of Nobel Prize 2004 for Sustainable Development)
As a responsible student how would you contribute to reduce and manage the waste generated in your surroundings. Explain by giving suitable examples.

(iii) With reference to the 3Rs, give a term that best describes each of the following :
(a) An empty soft drink can is used as a pen stand.
(b) Old scrap papers are used to manufacture handmade paper.
(c) No food is wasted in the household.

(iv) Give a reason for the following statements :
(a) Organic manure should replace chemical fertilisers.
(b) There should be a ban on the use of polythene and plastic products.
(c) Manual handling of waste must be avoided.

Ans :

(i) (a) Reason for the Substantial Rise of E-Waste in India: The rapid growth of technology usage, affordable electronic devices, and shorter product life cycles have significantly increased electronic waste (E-waste) in India.
(b) Dumping refers to the indiscriminate disposal of waste materials in open landfills, water bodies, or vacant areas, leading to pollution and environmental hazards.

(ii) As a responsible student, I can contribute to waste reduction by :
(a) Segregating waste – Separating biodegradable and non-biodegradable waste for proper disposal.
(b) Reusing materials – Using old notebooks for rough work and repurposing plastic containers.
(c) Spreading awareness – Educating peers on proper waste disposal and organizing cleanliness drives.
(d) Reducing paper use – Opting for digital notes instead of printing unnecessarily.

(iii) (a) Reuse – Using an empty soft drink can as a pen stand.
(b) Recycle – Using old scrap papers to manufacture handmade paper.
(c) Reduce – Ensuring no food is wasted in the household.

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(iv) (a) Organic manure should replace chemical fertilizers because it improves soil fertility naturally, prevents soil degradation, and is eco-friendly.

(b) There should be a ban on polythene and plastic products as they are non-biodegradable, pollute water bodies, and harm wildlife.

(c) Manual handling of waste must be avoided to prevent health hazards, infections, and toxic exposure from harmful waste materials.

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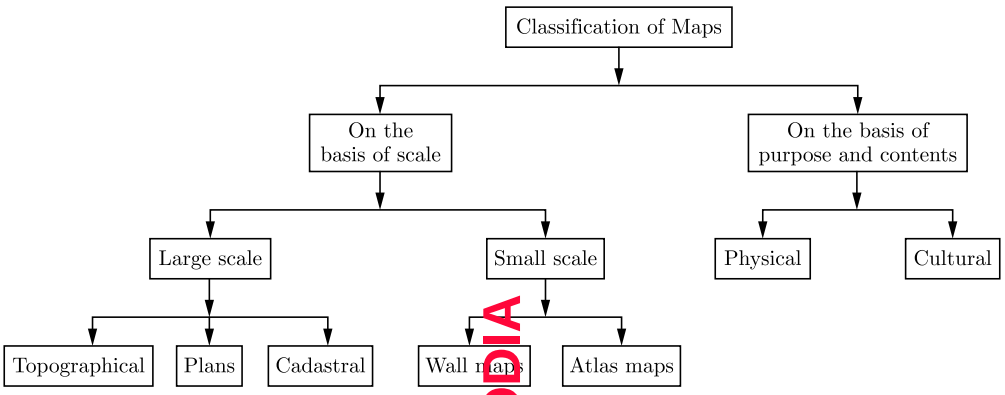
CHAPTER 1

INTERPRETATION OF TOPOGRAPHICAL MAPS

SUMMARY

A map is a partial or complete depiction of the Earth's surface, drawn to scale to represent actual ground positions accurately. Maps have been classified into:



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A topographical map is typically created on a large scale and displays details of both natural and human-made features. Relief features are represented using contour lines, while other elements are depicted through conventional symbols provided at the bottom of the survey sheet.

1. IMPORTANT TERMS AND CONCEPTS

1. **Aqueduct :** A masonry channel constructed to carry water from one place to another.
2. **Brackish Water :** Found in arid regions where intense heat causes excessive evaporation, leaving the water with a high salt content.
3. **Broken Ground :** Typically seen along river or stream banks in dry areas, caused by gully erosion after heavy rainfall following a dry spell.
4. **Causeway :** A raised, paved road built across a minor stream or a low-lying marshy area.
5. **Confluence :** The point where a tributary joins the main river.
6. **Conventional Signs :** Symbols used on maps to depict various objects.
7. **Depression :** Found in sandy areas, these are formed when wind blows away sand.
8. **Embankment :** Walls built around tanks or canals to control flooding.
9. **Fireline :** A cleared path around a forest to prevent the spread of fire.
10. **Falls :** Represents a waterfall, with its depth noted in metres.
11. **Kiln :** A large oven used for drying and baking materials like bricks, limestone and pottery.
12. **Meander :** A pronounced bend in a river.
13. **Man-Made Features :** Include surveyed trees, roads, causeways, mines, cart tracks, artificial lakes, post offices, inspection bungalows, police stations and

mines.

14. **Natural Features :** Include rivers, streams, sand formations, trees, broken ground, unlined wells, depressions, islands, hills, waterfalls and river valleys.
15. **Shelving :** A gentle slope along a riverbank.
16. **Vegetation :** Depicted on maps using terms like dense forest, open jungle, fairly mixed jungle, dense mixed jungle and bamboo forests.
17. **Colours on the Toposheet :** Various colours are used on maps to represent different features:

(a)	Yellow	–	Cultivated areas.
(b)	Green	–	Wooded and forested areas.
(c)	Blue	–	All waterbodies which are perennial (wells, river channels, tanks, reservoirs, etc.)
(d)	Brown	–	It includes contour lines with their numerical labels, as well as stony waste, gravel waste and sand features..
(e)	White	–	Barren land, uncultivated area, islands in a river.
(f)	Red	–	It represents grid lines, metalled and unmetalled roads, cart tracks, pack tracks, settlements, huts and buildings.
(g)	Black	–	It is used to represent surveyed trees marked with numbers on their trunks, along with riverbanks, broken ground, dry streams, elevations, railway lines, telephone and telegraph lines and lines of latitude and longitude.

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2. GRID REFERENCE

It refers to identifying the location of any feature on a map using grid lines. This can be done using either a four-figure grid reference or a six-figure grid reference.

2.1 Four Figure Grid Reference

A Four-Figure Grid Reference is a system used in maps to locate a specific area within a grid square. The grid is divided into squares using vertical (eastings) and horizontal (northings) lines, each numbered. The first two digits represent the easting (vertical grid line to the left of the square). The next two digits represent the northing (horizontal grid line below the square).

2.2 Six Figure Grid Reference

A Six-Figure Grid Reference is a more precise method of locating a point within a grid square on a map. It further divides the 1 km x 1 km square identified by a four figure grid reference into smaller sections. The first two digits represent the easting and the third digit specifies how far within the square (1/10th divisions) the point lies to the right. The fourth and fifth digits represent the northing and the sixth digit specifies how far within the square (1/10th divisions) the point lies upwards. This system pinpoints a location within a 100-meter precision.

3. HEIGHTS

1. **Contours :** Lines drawn on a map to connect all points of the same elevation above mean sea level.:— ◌ (brown lines). When contour lines are closely space the slope is steep. When they are far apart it shows that the slope is gradual.
2. The Contour Interval is the vertical distance between two consecutive contour lines. On topographical maps, it is typically 20 meters and is mentioned at the bottom of the map. Contour lines, whether continuous or broken, connect points of equal elevation above sea level.
3. **Formlines :** Sometimes accurate survey is not possible in hilly areas so these are used.:— ◌

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4. **Spot Heights :** These are dots marked on survey maps to indicate the exact elevation of a specific point above sea level. These are determined through precise surveying of the area.
5. **Trigonometrical Stations :** These are represented on survey maps in black. They are marked with a small triangle accompanied by the elevation of the point above mean sea level. These measurements are more precise than spot heights or contours., e.g.: – △ 180°
6. **Bench Marks :** These are markings placed on buildings, bridges, pillars, or other permanent structures, indicating the height at that point. These heights are determined through actual surveys. On maps, they are denoted by the letters B.M., followed by the elevation in meters, e.g., B.M. 610.
7. Gradient refers to slope of land.

4. MARGINAL INFORMATION

1. The Number of the toposheet is given below the topographical map. The sheet numbers 45 D/7 and 45 D/10 show parts of Gujarat and Rajasthan.
2. **Eastings and Northings :** These are vertical (Eastings) and horizontal (Northings) lines drawn in red on toposheets, forming a grid pattern. Their values are marked along the margins.
3. **Scale :** The scale is provided below the survey sheet and is expressed in three forms: as a representative fraction, a linear or graphical scale and a written statement.
4. **True North and Magnetic North :** The True North, also known as Geographic North, is the direction pointing toward the Earth's North Pole. The Magnetic North is the direction indicated by the Earth's magnetic field.
5. **Legend or Index :** Located below the map, it explains the conventional signs and symbols used.

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5. MEASURING DISTANCE ON THE MAP

1. This is the shortest distance between two points and can be determined in two ways. One method is to measure the distance directly using a divider or ruler and then convert it using the linear scale. Alternatively, the distance can be calculated with the help of the map's scale. For example, if 2 cm on the map represents 1 km and the measured distance between two locations is 5 cm, the actual distance would be 2.5 km.
2. Measuring Distance Along a Curved Road, River, or Canal : This can be achieved using a paper strip or a piece of thread. Place a knot at one end of the thread and position it at the starting point of the curved path. Carefully follow the path with the thread, marking the endpoint with an ink dot. Then stretch the thread along the linear scale and calculate the distance using the map's scale. The result is expressed in kilometers or meters, depending on the requirement. Ensure the correct unit (km or m) is used as specified in the question.

6. MODES OF TRANSPORT

1. **Roads :** Includes metalled and unmetalled roads, pack tracks and cart tracks, commonly found in plains or hilly areas.
2. **Railways :** Indicate well-developed towns and suggest active trade and connectivity.
3. **Air Communication :** Reflects the presence of advanced transportation and communication networks.

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7. OCCUPATION OF THE PEOPLE

1. **Agriculture :** Represented by yellow shading on the map, indicating cultivated areas and highlighting agriculture as the primary occupation.
2. **Mining :** Identified through symbols like lime kilns, brick kilns, limestone quarries, rock outcrops, or stony waste, suggesting mining as the main occupation.

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3. **Forestry :** Depicted in green on the map, indicating forests. Forestry involves gathering forest products like honey and herbs but does not include lumbering.
4. **Fishing :** Likely an occupation if water bodies are shown in blue.
5. **Service :** Includes working in public utility offices such as post offices or dispensaries.

8. SCALE

It represents the ratio or proportion between the distance shown on a map and the actual distance on the Earth's surface, expressed as a fraction. On topographical maps, scales are indicated in three different ways.

1. **Statement of Scale :** This method expresses the relationship between the map and the ground in words, e.g., "2 cm equals 1 km," or simply, 2 cm = 1 km.
2. **Representative Fraction (R.F.) :** This is a ratio indicating the proportion between the map distance and the actual ground distance, e.g., 1:50,000. This means 1 cm on the map corresponds to 50,000 cm on the ground. The numerator represents the map distance, while the denominator represents the actual ground distance.
3. **Linear or Graphic Scale :** Shown below the map, it consists of primary and secondary divisions. Using dividers, the distance between two points on the map is measured and converted into the actual ground distance using the linear scale.

MULTIPLE CHOICE QUESTION

1. What does a four-figure grid reference represent on a topographical map?
(a) Precise location using latitude and longitude
(b) A broad location within a grid square
(c) Elevation of a landform
(d) Distance between two points

Ans : SQP 2008

Thus (b) is correct option.

2. A six-figure grid reference on a map provides what type of information?
(a) Approximate area location
(b) Exact location within a grid square
(c) Direction of flow of water
(d) Elevation of the area

Ans : COMP 2012

Thus (b) is correct option.

3. In a six-figure grid reference, how many parts does the number get divided into?
(a) 2 (b) 4
(c) 6 (d) 8

Ans : MAIN 2001

Thus (c) is correct option.

4. What does the first two digits of a grid reference indicate?
(a) The vertical and horizontal divisions
(b) The Easting and Northing coordinates
(c) The exact location of a hill
(d) The distance in kilometers

Ans : SQP 2003

Thus (b) is correct option.

5. What is the definition of a contour line on a topographical map?
(a) A line that connects areas of equal population
(b) A line that connects points of equal elevation
(c) A line representing rivers
(d) A line that marks forest areas

Ans : MAIN 2023

Thus (b) is correct option.

6. What is meant by the term 'contour interval'?
(a) The difference in height between two consecutive contour lines
(b) The distance between the base and the summit of a mountain
(c) The total elevation of the landform
(d) The distance between the map and the real-world location

Ans : MAIN 2021

Thus (a) is correct option.

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7. Which landform is indicated by closely spaced contour lines?
(a) Gentle slope
(b) Steep slope
(c) Hill
(d) Valley

Ans : COMP 2017

Thus (b) is correct option.

8. Which landform is indicated by widely spaced contour lines?
(a) Steep slope
(b) Gentle slope
(c) Escarpment
(d) Ridge

Ans : SQP 2018

Thus (b) is correct option.

9. Which landform is marked by contours forming closed circles?
(a) Hill
(b) Valley
(c) Ridge
(d) Water divide

Ans : COMP 2008

Thus (a) is correct option.

10. What does an escarpment look like on a topographical map?
(a) Steep slope with widely spaced contours
(b) A sharp drop or steep slope between two flat areas
(c) A continuous flat plain
(d) A series of circular contours

Ans : MAIN 2001

Thus (a) is correct option.

11. Which term is used for the height of land marked by a triangulated point on a map?
(a) Spot height
(b) Bench mark
(c) Triangulated height
(d) Relative height

Ans : SQP 2010

Thus (c) is correct option.

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12. What is the term used to describe a permanently marked point for measuring elevation?
(a) Spot height
(b) Bench mark
(c) Triangulated height
(d) Contour interval

Ans : COMB 2011

Thus (b) is correct option.

13. What is the term used for the height of a point relative to the surrounding area on a map?
(a) Triangulated height
(b) Spot height
(c) Relative height
(d) Contour interval

Ans : COMB 2019

Thus (c) is correct option.

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14. What is the purpose of colour tints on topographical maps?
(a) To indicate different population densities
(b) To distinguish between different types of vegetation
(c) To represent elevation and landform features
(d) To show land use patterns

Ans : MAIN 2000

Thus (c) is correct option.

15. Which of the following represents water bodies on topographical maps?
(a) Black lines
(b) Blue shading
(c) Green lines
(d) Red shading

Ans : COMP 2005

Thus (b) is correct option.

16. What does a solid black line typically represent on a topographical map?
(a) Roads
(b) Buildings
(c) Contour lines
(d) Boundaries

Ans : SQP 2007

Thus (a) is correct option.

17. What is indicated by a dashed line on a map?
(a) A river
(b) A footpath or track
(c) A boundary
(d) A bridge

Ans : MAIN 2008

Thus (b) is correct option.

18. What is a linear scale on a map?
(a) A line that measures the exact distance between two points
(b) A system that calculates distances based on grid coordinates
(c) A symbol indicating elevation
(d) A scale for calculating area

Ans : SQP 2013

Thus (a) is correct option.

19. Which type of scale uses ratios like 1:50000?
(a) Linear scale
(b) Statement scale
(c) Representative fraction scale
(d) Verbal scale

Ans : MAIN 2004

Thus (c) is correct option.

20. What does a scale of 1:50000 mean on a map?
(a) 1 cm on the map represents 50,000 cm on the ground
(b) 1 km on the map represents 50,000 km on the ground
(c) 1 meter on the map represents 50,000 meters on the ground
(d) 1 cm on the map represents 500,000 cm on the ground

Ans : SQP 2001

Thus (a) is correct option.

21. How do you measure the distance between two points using the scale?
(a) Use a ruler to measure the straight-line distance, then multiply by the scale factor
(b) Use the grid reference to measure distance
(c) Use the scale directly to estimate the distance
(d) Estimate the distance based on the contour interval

Ans : MAIN 2001

Thus (a) is correct option.

22. Which of the following is the correct order of cardinal points on a map?
(a) North, East, South, West
(b) East, South, North, West
(c) North, South, East, West
(d) North, West, East, South

Ans : SQP 2008

Thus (a) is correct option.

23. Which of the following would likely be identified as a settlement pattern?
(a) Forest areas
(b) River direction
(c) Population density
(d) Distribution of roads

Ans : COMP 2016

Thus (c) is correct option.

24. What type of settlement pattern is typically found in areas with irregular terrain?
(a) Nucleated
(b) Linear
(c) Dispersed
(d) Circular

Ans : MAIN 2022

Thus (c) is correct option.

25. What is the direction of flow for a river indicated by contour lines?
(a) Upstream
(b) Downstream
(c) Parallel to the contours
(d) It cannot be determined from the contours

Ans : COMP 2017

Thus (b) is correct option.

26. Which of the following drainage patterns is characterized by rivers flowing in a branching manner like tree branches?
(a) Dendritic pattern
(b) Radial pattern
(c) Trellis pattern
(d) Rectangular pattern

Ans : SQP 2014

Thus (a) is correct option.

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27. What does a "V-shaped" contour indicate on a map?
(a) A hill
(b) A river valley
(c) A ridge
(d) A flat plain

Ans : SQP 2004

Thus (b) is correct option.

28. Which type of drainage pattern is most likely to occur in areas with alternating hard and soft rock layers?
(a) Dendritic
(b) Radial
(c) Trellis
(d) Rectangular

Ans : MAIN 2007

Thus (c) is correct option.

29. Which of the following is a natural feature that can be identified on a topographical map?
(a) Roads
(b) Railway tracks
(c) Forests
(d) Bridges

Ans : COMP 2012

Thus (c) is correct option.

30. Which of the following is a man-made feature that can be identified on a topographical map?
(a) River
(b) Hill
(c) Dam
(d) Mountain

Ans : SQP 2005

Thus (c) is correct option.

ONE MARK QUESTIONS

31. What are cardinal points ?

Ans : MAIN 2024

Cardinal points are the four main directions: North, South, East and West.

32. How are Bench marks shown on the map ?

Ans : MAIN 2012

On a map, these are represented by the letters BM, followed by the height in feet or meters, e.g., BM 610.

33. Name two methods by which relief is shown on the map.

Ans : SQP 2006

(i) Contour lines
(ii) Spot height

34. What is cartography ?

Ans : COMP 2005

Cartography is the art and science of creating maps, diagrams and charts.

35. Classify the maps on the basis of scale.

Ans : SQP 2022

Maps are classified by scale into large-scale maps (detailed, small areas) and small-scale maps (less detail, large areas).

36. What do you understand by 'scale' of a map?

Ans : MAIN 2018

The scale of a map is the ratio or proportion between a distance on the map and the corresponding actual distance on the Earth's surface.

37. What is statement of scale ?

Ans : COMP 2014

The statement of scale expresses the relationship between map distance and ground distance in words, e.g., "2 cm equals 1 km."

38. How linear scale is drawn on the map ?

Ans : MAIN 2016

A linear scale is a straight line on the map divided into segments representing actual ground distances.

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39. Why is linear scale widely used on the maps ?

Ans : SQP 2013

A linear scale is widely used on maps because it allows for easy and accurate measurement of distances directly on the map, even if the map is enlarged or reduced.

40. A map extract has number of dry streams. What can you conclude about the rainfall ?

Ans : COMP 2011

The presence of numerous dry streams on a map extract indicates low and irregular rainfall, with streams flowing only during the rainy season.

41. What is Grid Square ?

Ans : SQP 2013

A grid square is the area formed on a map by the intersection of vertical and horizontal grid lines, typically representing a specific section of the Earth's surface, such as 1 square kilometer.

42. What do you understand by 'brackish' ?

Ans : SQP 2011

Brackish refers to water that is moderately salty, typically found in areas where freshwater mixes with seawater, such as estuaries or in regions with high evaporation.

43. What is 'causeway' ?

Ans : MAIN 2002

A causeway is a raised, paved road or path built across a minor stream or a low-lying marshy area.

44. What is meant by 'aqueduct' ?

Ans : COMP 2004

An aqueduct is a masonry channel or structure built to carry water from one location to another, often over long distances.

45. What is trellis drainage pattern ?

Ans : MAIN 2006

A trellis drainage pattern features streams where tributaries join the main river at right angles, common in areas with alternating rock layers.

46. What is a scale?

Ans : SQP 2004

Scale is the ratio of a distance on a map to the corresponding distance on the Earth's surface.

47. How is gradient indicated by contour lines?

Ans : SQP 2009

The gradient is indicated by the spacing of contour lines: closely spaced lines represent a steep slope, while widely spaced lines indicate a gentle slope.

48. What is a grid ?

Ans : COMP 2004

A grid is a network of intersecting vertical (eastings) and horizontal (northings) lines on a map, used to locate specific points or areas.

49. What is a characteristic sheet ?

Ans : COMP 2010

A characteristic sheet is a detailed map sheet that highlights the prominent features of an area, such as landforms, vegetation, water bodies and settlements, often used for analysis or reference.

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50. What do you mean by Representative Function ?

Ans : MAIN 2014

The Representative Fraction (R.F.) is the ratio between a unit distance on the map and the corresponding unit distance on the ground.

51. What are the advantages of R.F. ?

Ans : COMP 2009

The Representative Fraction is advantageous because it can use any unit of distance and is universally applicable.

52. What is the confluence of a river?

Ans : MAIN 2010

It is the location where a tributary flows into the main river.

53. What is a meander?

Ans : COMP 2016

Meanders are the curves or bends that form in the middle course of a river where the terrain levels out.

54. What is broken ground? Explain how this is caused?

Ans : MAIN 2018

It is eroded land found along seasonal rivers, formed in areas where heavy rainfall follows a dry period.

55. What is a fireline?

Ans : SQP 2000

A fireline is a cleared area of about 5 meters in forests, created to prevent the spread of fire.

56. What is the RF on the Topographical sheets of India?

Ans : COMP 2008

The representative fraction on the Topographical sheets of India is 1 : 50,000.

57. What is a Depression?

Ans : COMP 2016

A depression is typically marked on the map in arid regions where the wind has eroded the soil, leaving a hollow, such as in desert areas.

58. What is a Kiln?

Ans : MAIN 2000

A kiln is a large oven used to dry and bake materials such as bricks, limestone and pottery.

59. What do you mean when the rivers are said to be stippled?

Ans : SQP 2006

Stippled (dotted) rivers are seasonal rivers that contain water only during the rainy season.

60. What is a 'Contour' ?

Ans : COMP 2022

The imaginary lines drawn on a map to connect places with the same elevation above sea level are called contour lines.

61. What is watershed or water divide ?

Ans : MAIN 2004

An imaginary line along a ridge that separates streams flowing toward one side from those flowing toward the other side is called a watershed or water divide.

62. What do you mean by the 'Key' of a map ?

Ans : SQP 2009

The 'Key' of a map provides the explanation for the symbols used on the map.

63. Where are the thickly settled areas located in a village ?

Ans : COMP 2011

Thickly settled areas in a village are typically located near key resources such as water sources, agricultural land and transportation routes, often at the village center or along main roads.

64. What does a dendritic drainage pattern indicate about the land ?

Ans : MAIN 2021

A dendritic drainage pattern, resembling the branches of a tree, indicates an area with soft soil that has been easily channeled by a river and its tributaries.

TWO MARKS QUESTIONS

65. Give the meaning of 'fireline'.

Ans : MAIN 2005

A fireline is a cleared strip of land surrounding a forest, created to stop the spread of fire. It acts as a barrier by removing vegetation and other combustible materials. Firelines are essential for forest fire management and safety.

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66. What is rock outcrop ?

Ans : SQP 2009

Open scrub with sparse desert vegetation and exposed rock surfaces is referred to as a rock outcrop on the map, where pieces of rock emerge from the main formation.

67. What is the meaning of 'Broken Ground' ?

Ans : MAIN 2013

This feature is typically found along the banks of seasonal rivers in arid regions, formed due to alternating wet and dry seasons. During the wet season, the land is submerged by floodwaters, while intense heat in the dry season causes rapid evaporation, leading to weathering.

68. What is dendritic drainage pattern ?

Ans : MAIN 2020

In a dendritic drainage pattern, tributaries converge from all directions to join the main river, resembling the branches of a tree. Smaller streams flow into larger ones, which ultimately join the main river. This pattern is also referred to as Pinnate drainage.

69. What is a Grid Reference?

Ans : SQP 2019

To locate a specific feature on an ordinance map, we use a system of rectangular coordinates. The lines running from north to south are called Eastings, while the lines running from east to west are known as Northings. When writing a grid reference, the Easting is listed first, followed by the Northing. This system helps to precisely identify locations on the map.

70. What are natural and man-made features?

Ans : COMP 2015

(i) Natural features are elements found in the environment that occur without human intervention. These include landforms such as mountains, rivers, lakes, forests and valleys, as well as natural resources like minerals, oceans and deserts.

(ii) Man-made features are those created or altered by human activity. These include buildings, roads, bridges, dams, cities and other infrastructure, as well as agricultural fields and land reclamation projects.

71. How does radial drainage pattern develop ?

Ans : SQP 2023

The radial drainage pattern, also called the centrifugal pattern, forms when streams diverge outward from a central elevated point. Features such as domes, volcanic cones, residual hills and tablelands support the development of this pattern.

72. How are True North and Magnetic North determined ?

Ans : COMP 2001

True North (TN) : The direction aligned with the Pole Star, which is nearly at the zenith of the North Pole. In the Northern Hemisphere, walking towards the Pole Star means moving towards true north.

Magnetic North (MN) : The direction indicated by the needle of a magnetic compass. Topographical maps display both true north and magnetic north for the convenience of field users.

73. The distance between two settlements is 6.5 cm on the map while the actual distance between them is 52 km. Find out the scale of the map.

Ans : COMP 2003

6.5 cm on the map represents = 52 km

1 cm represents $= \frac{52}{6.5} = 8$ km

It means 1 cm on map represents 8 km on the ground.

$$\text{R.F.} = \frac{\text{Map distance}}{\text{Ground distance}}$$

Now, 1 cm on map represents 8 km on the ground.

$$\text{R.F.} = \frac{1}{8 \times 1,00,000} = \frac{1}{8,00,000}$$

74. What are form lines ? Are they complimentary to contour lines ?

Ans : COMP 2000

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Form lines are broken lines drawn to represent the elevation and shape of hilly or mountainous regions. They are less accurate than contour lines and are based on visual observation rather than precise measurements.
Yes, form lines are complementary to contour lines, as they provide additional detail in areas where accurate contours are unavailable.

75. What is the shape of the contour representing 'mountain' ?

Ans : SQP 2013

A mountain is a landform that rises more than 3,000 feet above the surrounding area. On maps, mountains are depicted by closely spaced contour lines that show a steady increase in contour values with elevation. Mountains often feature multiple summits, representing peaks within the range.

76. What are Bench marks and how are they determined ?

Ans : MAIN 2008

Bench Marks are fixed reference points marked on permanent structures like buildings, bridges, or pillars to indicate their exact elevation above sea level.
They are determined through precise surveying methods, ensuring accuracy and are commonly used as a reference for further measurements. On maps, they are denoted by the letters B.M., followed by the height in meters or feet.

77. With reference to an escarpment, explain the terms:
(i) Crest
(ii) Cuesta

Ans : COMP 2012

(i) Crest : The crest is the highest point of an escarpment, representing the elevated ridge or topmost edge where the land meets a dramatic drop or slope on either side.
(ii) Cuesta : A cuesta is a type of ridge characterized by a steep scarp slope at the front and a more gradual dip slope at the rear. This landform is formed by differential erosion, where alternating layers of hard and soft rock erode at different rates, creating a distinct ridge with a sharp front and a gentler slope behind.

78. By which colours are the following shown on the toposheet ?
(i) Agriculture land
(ii) Forest land

Ans : MAIN 2011

(i) Agriculture land : Yellow.
(ii) Forest land : Green.

79. The distance between a school and a town on a map is 2 cm. Calculate the ground distance if the scale of the map is 1 cm to 12 km.

Ans : SQP 2004

1 cm on map represents 12 km of ground
2 cm represents $12 \times 2 = 24$ km.
The ground distance between school and town is 24 km.

80. What are topographical or ordinance survey maps ?

Ans : MAIN 2004

Topographical maps are detailed, large-scale, two-dimensional representations of the natural and human-made features of an area. Their large scale allows for the inclusion of considerable detail, showcasing features like hills, rivers, forests, towns, villages, roads, railways, canals, bridges, telegraph lines and more.

81. What is four-figure grid reference ?

Ans : SQP 2023

A four-figure grid reference is a system used to identify a specific grid square on a map. It uses two digits for the easting (vertical line) and two digits for the northing (horizontal line), pinpointing the square where they intersect.
For example, 3245 indicates the square where easting 32 and northing 45 meet, covering an area of 1 square kilometer.

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82. Distinguish between drainage system and drainage pattern.

Ans : COMP 2018

Aspect	Drainage System	Drainage Pattern
Definition	The network of rivers and streams in a region.	The arrangement or layout of rivers and their tributaries.
Focus	Emphasizes the composition of rivers and streams in an area.	Highlights the geometric pattern formed by the rivers and streams.
Examples	Includes rivers, tributaries and other water channels.	Includes dendritic, trellis, radial and rectangular patterns.

83. Give two points of difference between Bench Mark and Spot Height.

Ans : COMP 2000

Feature	Bench Mark	Spot Height
Definition	Fixed reference point with a known elevation.	Specific point on the map showing elevation.
Permanence	Permanent marker (e.g., metal plaque).	Shown on the map, not physically marked.

84. How does scale affect the area shown on the map?

Ans : SQP 2004

The ground area represented on a map varies with the scale used. Enlarging the scale reduces the area shown, as more detail is included. If two maps of identical size are drawn at different scales, the map with the smaller scale will cover a larger ground area, while the one with a larger scale will focus on a smaller area with greater detail.

85. What is an opisometre ?

Ans : MAIN 2001

An opisometer is a tool equipped with a small wheel attached to a recording dial. To measure a line, the wheel is carefully rolled along its length and the total distance is displayed on the dial in inches or centimeters. This measurement is then converted into the actual length in miles, kilometers, or other units using the map's scale. It is commonly used for accurate measurements of curved or irregular lines on maps.

86. How is a direction shown on a map ?

Ans : MAIN 2020

Direction on a map is represented using an angular bearing system, which measures the horizontal angle between the North-South reference line and the line connecting the observer's position to the object. This angle is calculated in a clockwise direction from the North-South line, providing a clear indication of the object's location relative to the observer.

87. What is the geometry of nucleated settlement pattern ?

Ans : SQP 2013

Nucleated settlements consist of houses built close together along narrow streets. The size of these compact settlements is influenced by the fertility of the soil and can range from small hamlets with 6-12 huts to larger settlements with populations of 500 to 1000 people.

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THREE MARKS QUESTIONS

88. Col, Gap and Saddle are very similar. How can you distinguish between them ?

Ans : MAIN 2024

Col, Gap and Saddle are similar features, but they can be distinguished by the characteristics of the depressions between two peaks.

In a Col, the depression is situated at a relatively higher elevation between the peaks.

In a Gap, the depression is closer to the valley floor, marking a lower point between the peaks.

Lastly, a Saddle has a shallow depression with gentle slopes, resembling the shape of a riding saddle.

89. Explain the four basic types of settlement pattern.

Ans : MAIN 2024

The four basic types of settlement patterns are:

1. Nucleated : Settlements where buildings are clustered together, often around a central feature like a market, church, or river.
2. Dispersed : Settlements where buildings are spread out over a large area, with more space between them, often seen in rural farming areas.
3. Linear : Settlements arranged in a line, typically along roads, rivers, or coasts, following a natural or man-made route.
4. Radial : Settlements that are arranged around a central point, with roads or other features radiating outward from the center.

90. What is Grid ? Give the importance of National Grid.

Ans : SQP 2004

A grid is a network of vertical (eastings) and horizontal (northings) lines drawn on a map to divide it into squares, allowing for accurate location referencing.

Importance of National Grid:

(i) Precise Location Identification : Helps locate places and features accurately using grid references.

(ii) Standardized Mapping : Provides a uniform system across the country for consistency in mapping.

(iii) Navigation and Planning : Assists in navigation, urban planning and disaster management.

91. Describe the spacing of contour lines in each of the following stages of a river .

(i) Upper Course

(ii) Lower Course

(iii) Middle Course

Ans : MAIN 2019

(i) Upper Course : In this stage, the contour lines are closely spaced, indicating a steep gradient and rapid elevation changes as the river flows through mountainous terrain.

(ii) Lower Course : In the lower course, the contour lines are widely spaced, reflecting the very gentle slope of the river as it approaches flatter land near its mouth, where the gradient is minimal.

(iii) Middle Course : During this stage, the contour lines are spaced further apart, signifying a more moderate slope. The river flows through valleys with gentler gradients, often forming meanders and floodplains.

92. Give reasons for the following :

(i) Layer colouring method of showing relief features is not suitable for topographic maps.

(ii) Conturs are widely used to represent relief features on topographic maps.

(iii) Wet point settlements are found in regions of low rainfall.

Ans : COMP 2014

(i) The layer colouring method for representing relief features is not ideal for topographic maps because it does not accurately indicate the height of the relief features.

(ii) Contours are commonly used to represent relief features on topographic maps because they precisely show the varying heights of different landforms.

(iii) Wet point settlements are those located on the banks of rivers or near tank

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bunds. These settlements are typically established near water sources due to irregular rainfall, which is why they are often found in areas with low rainfall.

93. Give the meaning of the following terms :
(i) Kiln
(ii) Relative height
(iii) Sheet rock.

Ans : SQP 2016

(i) A large oven or furnace used for drying, baking, or firing materials like bricks, pottery, or limestone.
(iii) The height measured relative to the surrounding area, rather than sea level. It may indicate the elevation at a dam, bridge, or sand dune, or the depth of a well, tank, river, or channel.
(iii) A large, flat expanse of exposed rock on the Earth's surface, often formed through erosion or weathering processes.

94. What are triangulation points ? For what purpose are they used ?

Ans : MAIN 2002

Triangulation points are fixed survey points marked on maps, often represented by a small triangle with the elevation noted. These points are established during a triangulation survey to determine precise locations and elevations.
They are used for:
(i) Mapping and Surveying : Providing reference points for creating accurate maps.
(ii) Navigation : Assisting in locating positions on the ground.
(iii) Scientific Research : Supporting geodetic and geological studies.

95. What are spot heights ? Why are they widely used in hilly regions ?

Ans : SQP 2009

Spot heights are specific points on a map marked with their exact elevation above sea level, determined through precise surveying. They are widely used in hilly regions because they:
(i) Provide accurate elevation data for specific locations.
(ii) Help represent uneven terrain where detailed contours may be difficult to draw.
(iii) Assist in navigation and planning by indicating critical high and low points.

96. What is Easting ? How is it shown on the map ?

Ans : COMP 2015

Easting refers to the vertical grid lines on a map that run from north to south and are used to measure distances eastward.
Representation on the map :
(i) Easting lines are numbered sequentially from west to east.
(ii) The numbers increase as you move eastward and are marked along the top or bottom margins of the map.
(iii) They help in determining the precise eastward location of a point when used with northings.

97. What is Northing ? How is it drawn on the map ?

Ans : MAIN 2007

Northing refers to the horizontal grid lines on a map that run from west to east and are used to measure distances northward.
Representation on the map:
(i) Northing lines are numbered sequentially from south to north.
(ii) The numbers increase as you move northward and are marked along the side margins of the map.
(iii) They help in determining the precise northward location of a point when used with eastings.

98. What is Representative Fraction (R.F.) ?

Ans : COMP 2000

Representative Fraction (R.F.) is the ratio between a distance on a map and the corresponding actual distance on the ground. It is expressed as a fraction or ratio, with

the numerator representing the map distance and the denominator representing the ground distance in the same unit.
For example, an R.F. of 1:50,000 means 1 unit on the map equals 50,000 units on the ground.

99. How plans are different from topographical maps ?

Ans : SQP 2009

Aspect	**Plans**	**Topographical Maps**
Scale	Very large scale, larger than 1:10,000.	Medium to large scale, 1:10,000 to 1:50,000.
Coverage	Small area with detailed features.	Larger area with natural and man-made features.
Detail Level	Precise details like layouts.	Broader features like hills and settlements.
Purpose	Used for construction and urban planning.	Used for navigation and regional analysis.

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100. Distinguish between Forward Bearing and Backward Bearing.

Ans : SQP 2006

Aspect	**Forward Bearing**	**Backward Bearing**
Definition	The angle measured clockwise from the north to the direction of travel.	The angle measured clockwise from the north to the opposite direction of travel.
Purpose	Used to determine the direction of a destination.	Used to determine the direction back to the starting point.
Measurement	Always measured in the direction of travel.	Always measured in the reverse direction.
Relation	Forward Bearing = Backward Bearing $\pm$ 180°.	Backward Bearing = Forward Bearing $\pm$ 180°.

101. Why is map projection essential for map drawing ?

Ans : COMP 2007

Map projection is essential for map drawing because it allows the three-dimensional curved surface of the Earth to be represented on a two-dimensional flat surface. This is crucial for:

(i) Accuracy : Ensuring accurate representation of distances, areas and directions.

(ii) Utility : Adapting maps for specific purposes, like navigation or geographic analysis.

(iii) Standardization : Providing a consistent framework for comparing and interpreting spatial data.

102. What is gradient and how is it measured ?

Ans : SQP 2005

Gradient refers to the degree of slope or steepness of a land surface. It represents how much the elevation changes over a certain horizontal distance. Gradient can be expressed as a percentage, indicating the ratio of vertical rise to horizontal distance, or as an angular measurement from the horizontal. It is an important factor in determining the slope characteristics of a terrain, affecting drainage, construction and land use planning.

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103. Explain 'Triangulation' as a method of surveying.

Ans : MAIN 2011

Triangulation is a surveying method involving precise measurement of a baseline and calculating the positions of a series of stations by measuring angles. Steps :

(i) A baseline is measured accurately.

(ii) Angles are observed from the ends of the baseline to various points using instruments like theodolites.

(iii) Using the baseline and angles, the distances and positions of other stations are calculated to form a network of triangles.

104. What is Index number map ?

Ans : SQP 2014

An Index Number Map represents the maximum extent of a map covering $4° \times 4°$ of latitude and longitude. These maps are drawn to a scale of 1:1 million and are systematically labeled with numerical figures such as 1, 2, 3, 45, 96, 132 and so on. They serve as a key reference for dividing large areas into manageable sections, allowing users to easily locate specific regions. This system is widely used for creating standardized and systematic topographical or thematic maps.

105. What is Quarter degree map ?

Ans : COMP 2018

Each one-degree map is further divided into sixteen smaller sections, with each section covering an extent of $15' \times 15'$ or $1/4° \times 1/4°$. These maps are drawn to a scale of 1:50,000 and provide greater detail than the one-degree maps. Each section is labeled sequentially as 1, 2, 3,...16, with an example notation like 45D/7, where the letter and number denote the specific part of the map series. This division ensures precise mapping and easier navigation for detailed studies.

106. What information do we get from a map ?

Ans : MAIN 2023

Maps provide invaluable information, offering a wealth of knowledge in a compact form that can be understood at a glance. They have been crucial in exploration, helping discover new continents and seas. For traders, maps help find the right directions for commerce, while in defense, they are essential for strategizing battles and safeguarding national boundaries. Maps also aid students in understanding the world and its geography. In essence, maps are indispensable tools in exploration, trade, defense and education.

107. List the three ways in which a scale can be represented.

Ans : SQP 2012

The three ways in which a scale can be represented on a map are:

(i) Representative Fraction (RF) : This is a numerical ratio, such as 1:50,000, where one unit on the map represents 50,000 units in real life.

(ii) Linear Scale (or Bar Scale) : This is a visual scale, often shown as a bar or line divided into segments, each representing a specific distance in the real world (e.g., 1 cm = 1 km).

(iii) Verbal Scale : This is a written statement describing the scale, such as "1 inch represents 1 mile" or "1 cm equals 100 meters."

108. State what is indicated by the following symbols about the land use.

(i) Tanks and canals

(ii) Open scrub

(iii) Stony waste

Ans : COMP 2016

(i) Tanks and Canals : This symbol depicts developed agricultural land with irrigation facilities, indicating that water sources like tanks and canals are used for irrigation, supporting farming activities.

(ii) Open Scrub : This symbol shows grazing land or pasture land, which is typically used for livestock grazing. The land is often covered with sparse vegetation, providing areas for animals to feed.

(iii) Stony Waste : This symbol represents

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uncultivated land that is unsuitable for agriculture due to the presence of stones and rocks, making it difficult to cultivate crops.

109. How can the climate of a place be inferred from the topo-sheet ?

Ans : MAIN 2018

Topo-sheets do not offer direct details about a place's climate, such as specific data on rainfall, temperature, or humidity. However, climate can be inferred from factors like the latitudinal position of the area and the type of vegetation present. For example, a location situated near the equator, such as at 10°N latitude, would generally experience a warmer climate compared to a place at a higher latitude, such as 35°N. The type of vegetation also provides clues, as tropical forests suggest a warm, humid climate, while sparse vegetation may indicate arid or temperate conditions.

110. Explain the four factors according to which drainage pattern varies.

Ans : COMP 2019

The four factors influencing drainage patterns are :

(i) Relief of the Area : Land features like mountains or valleys affect water flow, with steeper areas having faster water movement.

(ii) Nature of the Rocks : Hard rocks create straight drainage, while softer rocks lead to meandering patterns.

(iii) Amount of Rainfall : More rainfall results in larger, defined drainage networks, while less rainfall leads to sparse systems.

(iv) Slope of the Land : Steeper slopes cause faster water flow, while flatter land results in slower-moving, meandering water.

111. What is meant by drainage pattern with regard of the flow of rivers ?

Ans : COMP 2017

A drainage system consists of a network of rivers and their tributaries, shaped by the area's relief, rock type and land slope. These factors influence the flow of water and the arrangement of rivers and streams. When these rivers form distinct patterns based on the landscape, it is known as a drainage pattern. The type of drainage pattern, such as dendritic, radial, or trellis, reflects how geological and topographical features interact to shape the flow of rivers and streams.

112. On a contour map how are the following types of rivers shown :

(i) Perennial rivers

(ii) Non-perennial rivers

(iii) Irregular streams.

Ans : SQP 2019

(i) Perennial Rivers : These rivers, which flow throughout the year, are typically shown in blue color on a contour map, indicating their continuous presence.

(ii) Non-Perennial Rivers : Rivers that flow only during certain seasons or in response to rainfall are depicted in black color, signaling their intermittent nature.

(iii) Irregular Streams : Streams with an erratic or unpredictable flow pattern are represented by dotted lines, reflecting their inconsistent nature in the landscape.

113. How would you calculate the gradient between two points marked on a map ?

Ans : SQP 2015

To calculate the gradient between two points marked on a map, the process involves two key steps. First, the vertical interval is determined by finding the difference in the elevation values of the two points. This is done by subtracting the elevation of the lower point from the elevation of the higher point. Second, the horizontal equivalent is calculated using the map's scale. This involves measuring the straight-line distance between the two points on the map and converting it into the actual ground distance based on the map scale.

Once both the vertical interval and horizontal equivalent are obtained, the gradient can be calculated using the following formula

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i.e., the Gradient = Vertical interval/ Horizontal equivalent

114. What is meant by an area of inland drainage ? How is it shown on a contour map ?

Ans : SQP 2000

An area of inland drainage refers to a region where a river lacks enough water to reach the sea, causing it to dry up and flow inward into its basin. In such areas, the water collects within the internal basin, often evaporating or seeping into the ground rather than flowing outward.

On a contour map, an area of inland drainage is typically represented by dotted lines, indicating the boundary of the closed basin or depression where the river's flow is contained and does not have an outlet to the sea.

115. How are the features on landuse shown on topographic maps ?

Ans : COMP 2013

The land use features on topographic maps are represented as follows:

(i) Cultivated lands are depicted in yellow color.

(ii) Forests are shown in green color.

(iii) Reserved forests are marked with a boundary and labeled with the letters 'R.F.'.

(iv) Tea gardens, orchards, or vineyards are represented by symbols, with descriptive terms such as 'Dense Jungle,' 'Scrub Jungle,' or 'Tall Grass' printed on the map.

(v) Different types of trees, such as coconut or palm trees, are indicated by distinct symbols in green color.

(vi) Wasteland is left unshaded and labeled with terms like 'Stony Waste'.

116. What do the following mean ?

(i) Triangulated station

(ii) Brackish Well

(iii) Chhatri

Ans : COMP 2017

(i) Triangulated Station : A triangulated station is a point where the height of a location has been precisely surveyed and determined using trigonometry. It is represented by a dot enclosed within a triangle on a map.

(ii) Brackish Well : A brackish well is a well containing salty water, which is unsuitable for drinking.

(iii) Chhatri : A chhatri is a type of hut typically found in rural areas, marked in red color on maps. These huts are commonly located along major roads that connect villages to nearby towns.

117. State the ways in which scale is shown on the map.

Ans : SQP 2019

The scale on a survey map is represented in three ways:

(i) A statement, such as 2 cm = 1 km.

(iii) Representative Fraction or ratio method, for example, R.F = 1:50,000.

(iii) Graphical scale, which consists of a line with primary and secondary divisions indicating their corresponding measurements on the ground.

118. Differentiate between perennial and non-perennial rivers.

Ans : MAIN 2023

Feature	**Perennial Rivers**	**Non-Perennial Rivers**
Water Flow	Flow throughout the year	Flow only during certain seasons, mainly during the rainy season
Water Source	Fed by continuous sources like glaciers, springs, or rainfall	Dependent on seasonal rainfall
Examples	Ganga, Nile	Many rivers in arid and semi-arid regions

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119. Name the three basic patterns of drainage and briefly describe each of them.

Ans : MAIN 2013

The three basic types of drainage patterns are :

(i) Dendritic : A tree-like branching pattern where tributaries join the main river at acute angles.

(ii) Trellised : A rectangular pattern that forms when alternating layers of resistant and less-resistant rocks cause tributaries to join the main river at right angles.

(iii) Radial : A spoke-like pattern where streams flow outward in all directions from a central point, similar to the spokes of a wheel.

120. What do the following colours represent?

(i) Black
(ii) Blue
(iii) Green
(iv) Yellow
(v) White
(vi) Brown

Ans : SQP 2017

(i) Black : Represents broken ground and dry streams.

(ii) Blue : Denotes perennial water bodies.

(iii) Green : Indicates wooded or forested areas and orchards.

(iv) Yellow : Represents cultivated land.

(v) White : Signifies uncultivated land.

(vi) Brown : Used for contour lines and sand features.

121. What do the contour lines represent ?

Ans : COMP 2021

Contour lines represent the elevation and shape of the land on a map. Each line connects points that are at the same height above sea level, allowing you to visualize the terrain's slope and relief. The closer the contour lines are to each other, the steeper the slope; when they are farther apart, the slope is gentler. These lines help in understanding the topography of an area, including hills, valleys, ridges and depressions.

122. What advantages do contours have over hill shading and hachuring ?

Ans : SQP 2013

Hill shading and hachuring provide only a visual impression of the slope and landform, but they do not indicate the precise elevation or heights above sea level. In contrast, contour lines not only convey the slope of the land but also provide specific elevation values, showing both the shape of the terrain and the exact height of the land at different points relative to sea level. This makes contours far more informative for understanding the topography in detail.

123. What do you understand by V.I. and H.E. ?

Ans : MAIN 2018

V.I. (Vertical Interval) refers to the difference in elevation between two consecutive contour lines on a map. It helps in understanding the steepness or gradualness of the terrain.

H.E. (Horizontal Equivalent) is the horizontal distance between two consecutive contour lines, which shows how far apart the land is at the same elevation level. It helps in interpreting the terrain's steepness; closer contour lines indicate a steeper slope, while wider spacing suggests a gentler slope.

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124. Why do the contour different heights not cross each other?

Ans : MAIN 2005

Contour lines representing different heights do not cross each other because each contour line represents a specific, unique elevation. If they were to cross, it would imply that a single point on the map has two different elevations, which is not physically possible. The lines must remain separate to accurately depict the gradual changes in elevation across the terrain.

125. What is scattered settlement pattern ?

Ans : COMP 2004

A scattered settlement pattern is one where buildings and homes are spread out over a large area, rather than being clustered

together. This pattern is typically found in rural or agricultural regions, where the settlements are dispersed due to factors like the need for large plots of land for farming, or the availability of natural resources. In scattered settlements, people live far apart, often in isolated dwellings or small groups, rather than in concentrated villages or towns.

126. List various cultural elements shown on the toposheets.

Ans : SQP 2006

Various cultural elements shown on toposheets include:

1. Settlements: Locations of villages, towns, cities and hamlets.
2. Roads and Railways: Major and minor roads, highways, railway lines and stations.
3. Buildings: Structures such as houses, schools, factories and temples.
4. Land Use: Agricultural land, forests and areas of urban development.
5. Water Management Features: Canals, dams, reservoirs and irrigation systems.
6. Boundaries: Administrative boundaries such as district, state and country borders.
7. Bridges and Tunnels: Locations of bridges, tunnels and other infrastructure.
8. Religious and Cultural Sites: Temples, mosques, churches and other significant landmarks.

127. Name some physical elements represented by the toposheets.

Ans : COMP 2014

Some physical elements represented by toposheets include:

1. Rivers and Streams: Water bodies like rivers, lakes and ponds.
2. Mountains and Hills: High elevation areas, including peaks and ridges.
3. Valleys and Depressions: Low-lying areas between hills or mountains.
4. Forests and Vegetation: Areas covered by trees, shrubs and other plant life.
5. Contours: Lines showing elevation and the shape of the terrain.
6. Plains and Plateaus: Flat or gently sloping landforms.
7. Deserts: Arid, dry areas with little to no vegetation.
8. Coastal Features: Shorelines, beaches and other features related to seas and oceans.

128. What are spot heights ? Why are they widely used in hilly regions ?

Ans : MAIN 2022

Spot heights are represented on the map by a dot with an accompanying number, such as .341. These marks indicate locations on the ground where the elevation has been accurately measured, with the number showing the height in feet or meters. Spot heights are typically placed on hill summits or along roads, providing important reference points for understanding the terrain's elevation in specific areas. They are particularly useful for navigation and construction, especially in regions with varied or rugged topography.

129. What is the shape of the contour representing 'mountain' ?

Ans : SQP 2016

A mountain is an elevated landform that rises more than 3,000 feet above the surrounding areas. On a map, mountains are represented by closely spaced contour lines, with the contour values increasing as the elevation rises. Typically, mountains have multiple summits or peaks, which contribute to their complex and varied topography. The closer the contour lines are to each other, the steeper the slope of the mountain. These features are significant for navigation, climate and environmental studies, as they often influence local weather patterns and ecosystems.

130. What is Grid ? Give the importance of National Grid.

Ans : COMP 2022

An imaginary network of evenly spaced lines is printed on a map, forming a grid. This system allows for the precise location

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of a place to be determined more easily than using latitudes and longitudes. The National Grid is a coordinate system used for map referencing by the Ordnance Survey, providing a standardized method to pinpoint locations across a country. By using the National Grid, it becomes simpler and faster to identify specific areas on a map, which is crucial for navigation, land management and various geographical studies.

131. What are the factors that affect settlements in an area ?

Ans : MAIN 2004

(i) The relief and climate of the area : Settlements are typically absent in steep hillsides, marshy lands, or areas prone to waterlogging. People tend to settle in regions where the land is flat and suitable for agriculture.

(ii) Security : To ensure security for people and property, settlements often develop on higher ground to avoid flooding. Such settlements may also grow in strategically important locations, serving as defense centers. These settlements provide the advantage of protecting inhabitants from enemies and controlling access to key passes, harbors and factories.

(iii) Availability of transport and communication : Towns and villages typically develop at locations where roads, rivers, railways and other transportation networks facilitate trade and movement. Ports, on the other hand, emerge at the mouths of rivers, where they are also well-connected by roads and railways.

(iv) Centrally located settlement : A settlement may develop if it is centrally located in relation to other settlements (villages), serving as both an administrative and trade hub for the surrounding areas. Many small towns and villages in India host markets and fairs (melas) to fulfill this role.

(v) The availability of water and land for cultivation and other purposes.

(vi) The potential for mining and industry.

132. What are contours ? State their properties.

Ans : COMP 2006

Contour lines are imaginary lines drawn on a map that connect places with the same elevation above sea level. The properties of contours are as follows:

(i) Contour lines connect all locations at the same height above sea level.

(ii) Widely spaced contour lines indicate gentle slopes.

(iii) Closely spaced contour lines suggest steep slopes.

(iv) Uniformly spaced contour lines represent a consistent slope.

(v) The contour interval varies depending on the map's scale.

(vi) Contour lines typically do not intersect each other on the map, but in certain areas, they may intersect, indicating a steep cliff or waterfall.

133. Explain the following terms :

(i) Index Contours

(ii) Spot Hieghts

(iii) Triangulation Points

(iv) Bench Marks.

Ans : MAIN 2006

(i) Index Contours : To make maps easier to read, contour lines are thickened at regular intervals. These thickened lines are known as index contours.

(ii) Spot Heights : Spot heights provide additional information about the land surface between contours. They are represented by a number preceded by a dot.

(iii) Triangulation Points : When spot heights are accurately surveyed, the dot is enclosed within a triangle and these points are referred to as triangulation points.

(iv) Bench Marks : Bench marks are marks inscribed on stones or shown on buildings to indicate the precise height determined through surveys.

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134. State the essential features of a map.

Ans : SQP 2013

A map has five essential features:

(i) Title : It indicates the subject of the map, such as the distribution of natural vegetation, water bodies, climate, etc.

(ii) Scale : It represents the relationship between the distances on the map and the actual ground distances.

(iii) Direction : This refers to the cardinal directions-North, South, East and West. Conventionally, the North is positioned at the top of the map.

(iv) Key or Legend : It explains the meaning of the symbols used on the map.

(v) Grid System : This is typically formed by the intersection of lines of longitude and latitude.

135. What is a National Grid Reference (NGR) ?

Ans : COMP 2016

The National Grid Reference (NGR) system divides the area into 100 km × 100 km squares, with each square identified by a pair of letters, such as PQ UA, UQ, etc. Each 100 km square is further subdivided into 1 km squares. This system was developed by the Survey of India about a century ago, dividing the Indian subcontinent into 137 divisions. Each division was further divided into sixteen parts, labeled with capital letters from A to P. Each of these parts was then subdivided into sixteen smaller parts. The NGR system was created using a scale of 1:1,000,000.

136. How do contour lines show different slopes of land?

Ans : MAIN 2021

Contour lines show:

(i) Elevation of Land : The height of a contour is indicated by numbers placed in a break in the line.

(ii) Steepness of the Slope : When contours are closely spaced, they represent steep slopes. When they are farther apart, they indicate gradual slopes. The absence of contour lines signifies flat land, such as low-lying areas.

(iii) Shape of the Land at Various Heights: Contour lines reveal the shape of the land. For example, nearly circular contours with decreasing values inward represent a lake.

137. Define the following terms:

(i) Contour Interval

(ii) Contour Lines

(iii) Spot Height

(iv) Triangulation Height

(v) Bench Marks

Ans : SQP 2015

(i) Contour Interval (C.I.) : The difference in elevation between two consecutive contour lines is known as the contour interval.

(ii) Contour Lines : These are imaginary lines that connect all points with the same elevation above sea level.

(iii) Spot Height : Spot heights provide additional information about the relief between contours. They are represented by a dot followed by a number, such as 217, indicating the elevation of that point in meters.

(iv) Triangulation Height : These heights are determined through precise surveying and show the exact elevation of peaks, such as Δ 427.

(v) Bench Marks : Bench marks are permanent marks found on buildings or inscribed on stones, used as reference points for surveys. They are typically labeled as BM 200.

138. Define the following briefly :–

(i) Topographical map

(ii) An Atlas

(iii) R.F.

(iv) Hill Shading

(v) Relative Height

(vi) Interlocking Spurs.

Ans : MAIN 2014

(i) Topographical map : It is a large-scale map that displays detailed information about a small area, including both natural

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and man-made features, using specific fixed colors and conventional symbols.

(ii) An Atlas : It includes various types of small-scale maps, such as physical, political, agricultural, weather, demographic and historical maps, among others.

(iii) R.F. : It is a fraction that represents one unit on the map in the numerator and the corresponding number of similar units on the ground in the denominator. For example, an R.F. of 1:1000 means that one centimeter on the map represents 1000 centimeters on the ground.

(iv) Hill Shading : It is used in contour maps to indicate the nature of the slope, whether steep or gentle, through dark and light shading. However, it does not provide the exact elevation of the area.

(v) Relative Height : This refers to the difference between the highest and lowest elevation of an area, expressed in meters. For example, the symbol "15r" on a riverbank represents the elevation difference between the bottom and top bank of the river.

(vi) Interlocking Spurs : In mountainous regions, various small streams converge with the main stream, creating deep V-shaped valleys separated by elongated spurs in between. These spurs are known as interlocking spurs. This phenomenon results in a zigzag pattern of alternating valleys and spurs.

MAP BASED QUESTION

139. Study the extract of the Survey of India Map Sheet No. G43S10 Map 2 and answer the following questions [Eastings 61-71, Northings 13-23]:

(i) (a) Give the four-figure grid reference of the perennial well to the north of Jhamar.

(b) Give the six-figure grid reference of the temple at Shri Vashisht Ashram.

(ii) (a) What is the area in kilometres of the forested region enclosed within Eastings 66 and 71 and Northings 15 and 19?

(b) What is the compass direction of Hanumanji ka Mandir from Gautam Maharishi Mandir?

(iii) (a) What does the word 'Falls 15 m' in grid square 6718 indicate? Explain how these Falls are formed.

(b) What is the distance, in kilometres along the metalled road from distance stone 16 (grid square 6313) to the canal in grid square 6413?

(iv) (a) Abu is a big settlement with high water demand. From where does it get its main watesupply? Give two reasons to support your answer.

(b) What is indicated by the large number and the closeness of the contour lines in the given map extract?

(v) (a) What do the broken black lines in grid square 6221 indicate? How are they formed?

(b) Why are there no settlements except Abu in the given map extract? Give a reason to support your answer.

Ans : MAIN 2024

(i) (a) 6913

(b) 674190

(ii) (a) The area bounded by Eastings 66 to 71 and Northings 15 to 19 contains 20 grid squares. Since each grid square has an area of 1 km × 1 km, the total area covered by the 20 grid squares is 20 square kilometers.

(b) Hanumanji ka Mandir is in north-east direction from Gautam Maharishi Mandir.

(iii) (a) "Falls 15m" in grid square 6718 refers to a waterfall situated at an elevation of 15 meters. These falls are created in hilly regions where rivers encounter sudden, nearly vertical drops in their course.

(b) The map distance is 3.2 cm. Given the scale of 2 cm = 1 km, the actual distance is 1.6 km.

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(iv)(a) Abu is a hilly area that gets its water supply from seasonal streams, wells and manmade lakes. This is because due to followinf reasons:
1. There are no perennial rivers and streams only seasonal streams;
2. There are perennial lined wells and Nakhi Talao (indicated by blue coloured conventional symbols).

(b) The presence of a large number of closely spaced contours indicates that the land has a steep slope.

(v) (a) The broken black lines in grid square 6221 represent broken ground. These are typically found in arid or semi-arid regions, along the banks of seasonal rivers or streams, where the soil is soft and sandy. The ground cracks and breaks easily due to alternating dry and wet periods.

(b) There are no settlements other than Abu in the given map extract, as the area is predominantly forested with rocky knobs, lacks perennial streams and has limited transportation options and employment opportunities.

140. Study the extract of the Survey of India Map Sheet No. G43S7 Map 1 and answer the following questions [Eastings 25-35, Northings 89-99] :

(i) (a) Give the four-figure grid reference of the settlement of Nilpur.

(b) Give the six-figure grid reference of Chhatri north of Vadavas.

(ii) (a) State the compass direction of the settlement of Ratanpur from the settlement of Marwada.

(b) State two advantages that Dantiwada, south of river Banas has over other settlements in the region in the given map extract.

(iii)(a) What are the brown dotted clusters in the southern part of the given map extract? Also state what the letters Dep in the same area indicate.

(b) Explain why some of the streams in the south-eastern part of the given map extract do not join the main river? Name the settlement where these streams can be seen.

(iv)(a) What is the general pattern of human habitation (settlement) in the given map extract?

(b) Measure the length of the aqueduct in metres from the point whose s'ix-figure grid reference is 261920 to the point whose six-figure grid reference is 274929.

(v) (a) Name the two types of dams shown in the given map extract.

(b) How does the drainage pattern in grid square 2698 differ from the pattern of streams in grid square 2697?

Ans : SQP 2000

(i) (a) 2891

(b) 333964

(ii) (a) Ratanpur lies in north-east direction of Marwada.

(b) Dantiwada, located south of the Banas River, features a Post Office, two Rest Houses, overhead tanks and a network of paved roads.

(iii)(a) The brown dotted clusters in the southern part of the map extract represent sand features such as sand dunes and sand hills. The abbreviation 'Dep' stands for 'Depression,' which refers to a hollow found in sandy areas. These depressions are formed by winds that blow away the surface sand, leaving behind a low area.

(b) Some of the streams in the map extract do not join the main river because they flow over sandy soil, which absorbs the water before the streams can reach the main river. The streams near Ramsida are examples of this phenomenon.

(iv)(a) The general settlement pattern in the given map extract is nucleated or clustered.

(b) Map distance = 3.2 cm.
Since scale is 2 cm = 1 km, the actual distance is 1.6 km.

(v) (a) The two types of dams shown in the given map extract are - (1) masonry

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dam and (2) earth work dam.

(b) The drainage pattern in grid square 2698 is trellised, while in grid square 2697, it is dendritic.

141. Describe how drainage features are shown on topographic maps.

Ans : SQP 2013

Drainage features on topographic maps are represented as follows:

1. Perennial rivers are depicted in blue color.
2. Non-perennial rivers are shown in black color.
3. Irregular streams are indicated by dotted lines.
4. Large rivers are represented by double lines.
5. Small streams are marked with a single line.
6. The direction of the river flow is indicated by an arrow.
7. Waterfalls are labeled with the word 'Falls'.
8. Rapids along the river are indicated by the word 'Rapids'.

142. Study the extract of the Survey of India Map Sheet No. G43S7 Map 1 and answer the following questions [Eastings 25-35, Northings 89-99]:

(i) (a) Give the four-figure grid reference of the settlement at Lodpa.

(b) Give the six-figure grid reference of the Spot height 172.

(ii) (a) Identify the features from the conventional signs, the six-figure grid reference of which is 332963.

(b) Give the compass direction of Ramsida from Nandotra.

(iii) (a) Measure the length in kilometres of the masonry dam on the main river in the given map extract.

(b) Identify the type of road that runs from the Police Station at Dantiwada up to the settlement at Nandotra (Brahmanvas) (grid square 2794). For which purpose is this road used?

(iv) (a) Calculate the area of the region in sq. km, enclosed within the Eastings 25-35 and Northings 91 to 95.

(b) State the three types of roads seen in the given map extract. What do they reflect on the type of settlements in the region in the given map extract?

(v) (a) State the difference in the pattern of settlement at Dantiwada on the right bank of the main river and the one on the left bank of it.

(b) What is the main form of irrigation in the area north of Sarod Nala? From what can you infer this source of irrigation?

Ans : COMP 2016

(i) (a) 2991.

(b) 265972.

(ii) (a) Chhatri

(b) Ramsida lies in south-east direction from Nandotra.

(iii) (a) The distance on the map is 3.6 cm and with a scale of 2 cm = 1 km, the actual length of the dam is 1.8 km.

(b) The road from the Police Station at Dantiwada to the settlement at Nandotra (Brahmanvas) is a pack track with a pass. Although it is a shorter route, it becomes unusable during the rainy season. This path is typically used by packs of animals, groups of humans, or both.

(iv) (a) The total number of grid squares within the area bounded by Eastings 25 to 35 and Northings 91 to 95 is 40. Each grid square covers an area of 1 km $\times$ 1 km, which equals 1 square kilometer. Therefore, the total area of the 40 grid squares is 40 square kilometers.

(b) The given map extract shows three types of roads: metalled roads, cart tracks and pack tracks. This indicates that more developed settlements, such as Dantiwada, Dhanawad, Jorapura and Marwada, are connected by metalled roads, suggesting they may be towns or cities. In contrast,

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smaller settlements, likely villages, are connected by cart tracks and pack tracks

(v) (a) Dantiwada on the left bank of the main river follows a linear settlement pattern along the metalled road, while Dantiwada on the right bank of the river has a clustered settlement pattern.

(b) Perennial lined wells are the primary source of irrigation in the area north of Sarod Nala, as indicated by the conventional symbol for lined wells. The presence of these wells, along with the yellow wash on the map extract, suggests that agriculture is the main occupation of the people in this region.

143. Study the extract of the Survey of India Map Sheet No. G43S10 Map 2 and answer the following questions [Eastings 61-71, Northings 13-23]:

(i) (a) Give the four-figure grid reference of the settlement of Deoli.

(b) Give the six-figure grid reference of the surveyed 'tree 277'.

(ii) (a) What is the area in kilometres of the administrative area enclosed within the Eastings 68 and 70 and the Northings 21 and 23?

(b) What is the compass direction of St. Mary's High School from Gautam Maharishi Mandir?

(iii) (a) What is the distance in kilometres along the metalled road from Hanumanji ka Mandir till it merges with another metalled road in grid square 6820.

(b) How can you conclude that Abu is an administrative area? Give a reason to support your answer.

(iv) (a) What is meant by 501 in grid square 6421.

(b) How can you conclude that the yellow area in the south-east corner of the map is an agricultural land?

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(v) (a) How is the drainage pattern in grid square 6220 differ from the drainage pattern in grid square 6817?

(b) What is the difference between the slope in grid square 6320 and the one in 6622? Give a reason to support your answer.

Ans : SQP 2021

(i) (a) 6918

(b) 638163

(ii) (a) The area bounded by Eastings 68 to 70 and Northings 21 to 23 contains 4 grid squares. Since each grid square has an area of 1 km × 1 km, the total area covered by the 4 grid squares is 4 square kilometers.

(b) St. Mary's High School lies in north-east direction from Gautam Maharishi Mandir.

(iii) (a) Map distance is 4.2 cm. Since scale is 2 cm = 1 km, the actual distance is 2.1 km.

(b) Abu is an administrative area, as indicated by the presence of several government buildings, such as Raj Bhawan, Limdi House, Rest Houses, Circuit House and Police Station. Additionally, its connectivity with other areas through metalled roads further highlights its administrative significance.

(iv) (a) 501 in grid square 6421 refers to the Spot Height, indicating the surveyed elevation of 501 meters at that specific location on the map.

(b) The yellow area in the southeast corner of the map indicates a plain, cultivated region. The absence of contours in this area suggests it is a flat plain. Additionally, the presence of a river, marked by the word "Nadi," along with a canal and sluice, indicates the area is used for irrigation.

(v) (a) The drainage pattern in grid square 6220 is trellised, while in grid square 6817, it is dendritic.

(b) In grid square 6320, the slope is gradual and gentle, as the contour

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lines are spaced far apart. In contrast, in grid square 6622, the slope is steep, as the contour lines are drawn very close together.

144. Study the extract of the Survey of India Map Sheet No. G43S7 and answer the following questions:

(i) (a) Give the four-figure grid reference for Δ 224.
(b) What is the contour interval used in the given map extract?

(ii) (a) Mention two man made features seen in grid square 2706.
(b) Mention two natural features seen in grid square 2905.

(iii)(a) What do you understand by 1:50,000 printed below the map extract?
(b) What is the pattern of drainage seen in the grid square 2505?

(iv)(a) What do you understand by .10r in 2709?
(b) What is the compass direction of Mahudi Nani (2604) from Panswala (2909)?

(v) Calculate the area in kilometre square of the region enclosed between Easting 26 to 29 and Northing 05 to 11.

Ans : MAIN 2023

(i) (a) 2706
(b) Contour interval given in the map is 20 meters

(ii) (a) Two human-made features in grid square 2706 are a lime kiln, a covered tank, a chhatri, a metalled road, a lined well, permanent huts and a powerline.
(b) Two natural features in grid square 2905 are a seasonal stream, sand dunes, broken ground and barren land.

(iii) (a)The notation 1:50,000 printed below the map extract represents the scale of the map. This means that 1 unit of measurement on the map (e.g., 1 centimeter or 1 inch) corresponds to 50,000 of the same units on the ground.
(b) The drainage pattern in grid square 2505 is dendritic, resembling tree branches. Tributaries join the main river at acute angles.

(iv)(a) .10r in 2709 is the relative height of the sand dune, which is 10 metres
(b) The compass direction of Mahudi Nani from Panswala is southwest.

(v) The area enclosed between Easting 26 to 29 and Northing 05 to 11 is :
3 grid squares (Easting) × 6 grid squares (Northing) = 18 grid squares.
Since each grid square equals 1 km², the total area is 18 km².

145. Study the extract of the Survey of India Map Sheet No. G43S7 and answer the following questions:

(i) (a) Give the six-figure grid reference for spot height .522.
(b) What is the pattern of settlement in the grid square 3591?

(ii) (a) Mention two man-made features seen in the grid square 3794.
(b) Mention two means of transport used by the people of Nani Bhatamal in the grid square 3691.

(iii)(a) Identify the landform marked by the contours in the grid square 3896.
(b) What is the pattern of drainage seen in the grid square 3697?

(iv)(a) What is the reason for the presence of causeway in the grid square 3695?
(b) What is the compass direction of Khara (4097) from Karja (3994)?

(v) Calculate the area in kilometre square of the region to the south of 94 Northing.

Ans : MAIN 2024

(i) (a) 375976
(b) dispersed settlement

(ii) (a) Chhatri, cart track, pack track, lined perennial wells and permanent settlements .
(b) Cart track and pack track are the means of transport used by the people.

(iii)(a) Ridge
(b) Radial drainage

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(iv)(a) The presence of a causeway indicates that the region experiences relatively low rainfall.
(b) North-east
(v) The area of the region to the south of 94 Northing is calculated as follows:
Scale given: 2 cm (in a grid square) = 1 km
There are 6 grid squares to the south of 94 Northing and the length of the toposheet provided is 10 grid squares.
Area = Length × Width
= 10 grid squares × 6 grid squares
= 60 km2

146. Study map sheet no. G43S10; Eastings 53 to 62, Northings 26 to 36 and answer the following questions: Map 3

1. Give the 4 figure grid reference of the following:
   (i) Dangrali
   (ii) Open scrub in South-East
2. Give the 6 figure grid reference of the following:
   (i) Triangle 413 in South West
   (ii) Surveyed tree 294 in North
3. What is the meaning of the following conventional signs?
   (i) (Black) in grid square 4402
   (ii) 400 m (brown) in grid square 3901
   (iii) in grid square 4001
   (iv) Red broken line in grid square 3808
4. Name four man made features in grid square 6131.
5. Give two reasons why some of the land shown on the map is not cultivated.
6. Name the main left bank tributary of the main river with its direction.
7. Give the 6 figure grid reference of the well near the road connecting Dangrali and Nagani. What is the total depth of the well?
8. Name the landforms represented by the pattern of contours in grid square 5427.
9. What advantages does a Representative Fraction have over a verbal scale?
10. Give the 4 figure grid reference of the confluence of Dior Nadi with Sipu Nadi.
11. Mention two factors which support that the Sipu Nadi is in its middle course.
12. If a man is to walk from Dedarla to Hathal :
    (a) In which direction would he be walking?
    (b) Name the kind of road he will we using.
13. Name two regions shown on the map which are unsuitable for the cultivation of crops.
14. Which is the most important occupation of the people residing in South West part of the toposheet? Give reason.
15. How are the following represented on the map:
    (a) Cultivated land
    (b) Wooded land
16. How does the drainage pattern in the grid square 5434 differ from those in 5427 and 5626?
17. How many types of tracks are shown in the map extract? Name them.
18. Name any one man-made feature in grid square 5428.
19. Identify and write the grid square (in the east part of the map) where people meet yearly.
20. Name three prominent features of the river being depicted in grid 6031.
21. If a man was to walk from Dadrla to Dangrali:
    (a) How much distance (in Km.) will he be covering?
    (b) Name any two physical feature he can notice on the way.
22. Explain the meaning of each conventional sign, the six figure grid reference of which has been given below:
    (a) 617271
    (b) 604275

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Ans : MAIN 2021

1. (a) 5635
   (b) 6028
2. (a) 544273
   (b) 591356
3. (a) Dry tank
   (b) Earthwork dam
   (c) Cart track
   (d) Permanent hut

4. Post office, metalled road, power line, temple.
5. (a) Presence of open scrub and marble stone.
   (b) Presence of broken ground.
6. Left bank tributary : Sipu Nadi
   Direction : North East to South West
7. These are many well on the road and depth is not metnioned.
8. Hill
9. The Representative Fraction (R.F.) has universal applicability, allowing anyone to determine the distance on a map, regardless of their familiarity with specific units of measurement.
10. 5930
11 Wide river bed.
   Presence of Island.
12 (a) Direction : South East
   (b) Road : Cart track
13. South Western region and South region.
14. Mining - due to presence of white wash and stone quarries.
15. (a) Yellow wash
   (b) Green wash
16. 5434 - Dendritic Whereas
   5427 - Radial and 5626 - Rectangular.
17 Cart track (one)
18. Power line
19. 6131
20. Island, dry river bed filed with stones, rocks, etc. meandering (middle course).
21. (a) 7.2 cm $= \frac{7.2}{2} = 3$ km 600 m
   (b) Dry streams and Dry tanks.
22. (a) dry tank.
   (b) Permanent hut.

147. Study map sheet no. G43S10; Eastings 48 to 55, Northings 13 to 23. Map 4.

1. What do you mean by contour interval?
2. Give four figure grid references of the following:
   (a) Village Marol
   (b) Temple in West of Rajgarh
   (c) Fairly dense scrub in south-east
   (d) Dry tank south-east of Mitan.
3. Give six-figure grid reference of the following:
   (a) 254 near Rampura Khera
   (b) Temple at village Marol
   (c) Dry tank west of Rajgarh
   (d) 3r in North-East of Marol.
4. What is the meaning of the following conventional signs:
   (a) 243 (in red) in grid square 5322
   (b) 5r in grid square 5221
   (c) A (Blue) in grid square 4813
   (d) Q in grid square 4813
   (e) Blue circle in grid square 4922
5. Give the directions of the following:
   (a) Mitan (5021) from Rajgarh (5222)
   (b) Salotra (5214) from Padrugarh (5017)
   (c) Marol (4919) from Nimbora (5221)
   (d) Nimbora (5221) from Rampura Khera (5218)
6. Find out the distances between the following :
   (a) Direct distance in km between Mitan (5021) and Nimbora (5221).
   (b) Indirect distance in km along the road Nimbora (5221) to Mitan (5021).
7. Calculate the area in square kilometre of the region enclosed by Eastings 48 to 52 and Northings 13 to 17.
8. (a) Name two types of vegetation in the givenmap extract.
   (b) Find out the lowest and highest altitudes in the area.
9. What is the main occupation of the people living in the area shown in the map extract?
10. Give two reasons to support your answer.
   (a) Which is the most common mode of transport in the region?
   (b) What do you infer about the climate of this region?
11. Give the settlement patterns of the following:
   (a) In grid square 5322
   (b) In grid square 5019
12. What is the
   (a) In grid square 5420
   (b) In grid square 5314
   (c) In grid square 5315
13. (a) Name the season experienced by the map extract.

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(b) Give two reasons to support your answer.

14. How is settlement pattern of Salotra (5214) differ from Karaunti (5321)? Give any two reasons for the difference.
15. What do the following numbers in grid square 5316 represent?
    (a) 273 in black
    (b) 2 in red
16. What is the value of the contour lines in grid square 4822?
17. Name and give the four grid reference of a settlement where the people of the region meet at least once in a month.
18. How are the gentle and steep slopes shown on a map?

Ans : SQP 2019

1. The difference between two successive contours is known as contour interval.
2. (a) 4920
   (b) 5222
   (c) 5314
   (d) 5021
3. (a) 526187
   (b) 493199
   (c) 525228
   (d) 496209
4. (a) Milestone
   (b) Relative height of river bank is 5 m
   (c) Dispensary
   (d) Unlined well
   (e) Perennial lined well.
6. (a) South-West
   (b) South-East
   (c) South-West
   (d) North
7. (a) 4.6 cm $= \frac{4.6}{2} = 2$ km 300 m
   (b) 4.8 cm $= \frac{4.8}{2} = 2$ km 400 m
8. Area $= 4 \times 4 = 16$ sq km
9. (a) Open mixed jungle, Open scrub.
   (b) Lowest = 242; Highest : 365
10. Farming
11. (a) Metalled road : This road connects major towns and is equipped with power lines along its route.
    (b) Tropical Monsoon Climate : The area depicted in this map sheet falls within India, which experiences a tropical monsoon climate.
12. (a) Nucleated
    (b) Dispersed
13. (a) Dendritic
    (b) Radial
    (c) Rectangular
14. Summer season (March-June)
    Presence of open scrub.

Salotra Dispersed	Karunati Nucleated
Lack of transport	Well connected with transport.
Lack of facility	Presence of temple, power line.

15. (a) Spot heights
    (b) Meander
16. 240
17. Marol, 4919
18. Gentle slopes : Contours are widely spaced.
    Steep slopes : Contours are closely spaced.

148. Study map sheet no. G43S10; Eastings 48 to 55, Northings 13 to 23. Map 5.
(a) What do you understand by Representative Fraction (R.F.)?
(b) How are :
    (i) Cultivated land
    (ii) Wooded land represented on the map?
(c) What is the general pattern of human habitation in the map extract?
(d) Calculate the area of land enclosed within eastings 64 to 68 and northings 19 to 23.
(e) What, according to you, is the main
    (i) Occupation of the people.
    (ii) Source of irrigation
(f) Give the four-figure grid references of the following:
    (i) Raghunath Temple
    (ii) Adhar Devi ka Mandir
    (iii) D1409
    (iv) Nakhi Talao
(g) Give six-figure grid reference of the following:
    (i) Gautam Maharishi Mandir
    (ii) Anadra point

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(iii) Shri Vashisht Ashram
(iv) Fall 12 m

(h) Give the meaning of the following:
(i) 11r fall in grid square 6718
(ii) D1401 grid 6620
(iii) Å in grid square 6822
(iv) in grid square 6822

(i) Give the direction of the following:
(i) Gautam Maharishi Mandir (6518) from Sunset Point (6621)
(ii) Abu (6821) from Anadra point 6722
(iii) Fatehpura (6115) from Sri Vashisht Ashram (6719)
(iv) Surveyed tree 277 (6316) from Gautam Maharishi Mandir (6115)

(j) Mention two modes of transport with conventional signs.

(k) What is the general slope of the land? Give reason.

(l) Mention one natural feature in the following grids:
(i) 6818
(ii) 6719

(m) Give the drainage pattern of the following:
(i) in grid square 6217
(ii) in grid square 6116
(iii) in grid square 6319

(n) Town Abu is a tourist spot. State any three evidences for the same.

(o) There is an absence of human habitation in the south-eastern parts of the map extract. State any three reasons for the same.

(p) What do you understand by:
(i) Red broken line in grid 6517.
(ii) Closed spaced contour line in grid square 6814.
(iii) Blue coloured circle in grid square 648153.

(q) What type of settlement you can notice in grid square 6115? Give two reasons for such type of settlement.

(r) What do the following mean:
(i) Black line with 9r in grid 6424.
(ii) Rocky knob 6523.

Ans : COMP 2018

(a) The Representative Fraction (R.F.) is the ratio between the distance on a map and the actual distance on the ground. It is expressed as a fraction, with the numerator always being one.

(b) (i) Cultivated land - Yellow colour
(ii) Wooded land - Green colour

(c) The general pattern of human habitation is scattered except ABU.

(d) Area : No. of northings = 4
No. of eastings = 4
Area = 4 × 4 =16 sq. km.

(e) (i) Lumbering
(ii) Wells, seasonal streams, man-made lakes.

(f) (i) 6721
(ii) 6823
(iii) 6723
(iv) 6722

(g) (i) 676218
(ii) 672225
(iii) 675191
(iv) 675183

(h) (i) Water is falling from the relative height of 11 m.
(ii) It refers to the triangulation heights.
(iii) Hospital
(iv) Circuit house.

(i) (i) South
(ii) South East
(iii) South West
(iv) South West

(j) Metalled Road ======
Pack track _ _ _ _ _

(k) The general slope of the land is directed towards the South-West, as the streams flow in that direction.

(l) (i) 6818 - dry stream, waterfall, rocky knob.
(ii) 6719 - dry steams.

(m) (i) Radial
(ii) Dendritic
(iii) Radial

(n) Abu is a popular tourist destination, featuring attractions such as Nakhi Talao, Hanumanji ka Mandir, Sunset Point and scenic waterfalls.

(o) The area is largely covered by forests with rocky outcrops, lacking perennial streams

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and proper transportation infrastructure.

(p) (i) Footpath
(ii) It indicates that slope of the land is steep.
(iii) Unlined well.

(q) It is scattered due to the absence of facilities.

(r) (i) Relative height of embankment is 9 m
(ii) Isolated prominent peak.

149. Study map sheet no. G43S7; Eastings 48 to 45, Northings 01 to 11 and answer the following questions : Map 6 (attached at page number 326)

(a) What are the other methods of representing scale besides R.F.?

(b) Give the four-figure grid references of the following:
(i) D 349
(ii) Village Padar
(iii) Village Deri
(iv) Temple near village Dhibri
(v) Village Methipura
(vi) Vavdhara

(c) Give the six-figure grid reference of the following:
(i) D 284 in the west
(ii) Perennial lined well east of Padar
(iii) 292 south-west of Dhibri
(iv) Temple in village Dhibri.

(d) What is the meaning of the following conventional signs:
(i) _____(Black) in grid square 4402
(ii) 400 m (brown) in grid square 3901
(iii) in grid square 4001
(iv) Red broken line in grid square 3808
(v) 22r in grid square 4410
(vi) D 284 in grid square 3807
(vii) 3r in grid square 4001

(e) Give the directions of the following:
(i) Village Dhibri (4206) from Deri (3804)
(ii) D 284 (3807) from D 349 (4311)
(iii) Village Vavdhara (4004) from Padar (4410)

(f) Find out the distances between the following:
(i) Direct distance between Deri (3804) and Padar (4411)
(ii) Indirect distance in kilometre along the Dholva Nadi from village Dhibri to the western edge of the map.

(g) What is the area in square kilometre of the cultivable region enclosed by Easting 40 and 44, Northing 04 and 06?

(h) With reference to physical features, what is indicated by the large number and closeness of the contour lines in the south-east of map extract?

(i) Give the drainage patterns of the following:
(i) In grid square 4302
(ii) In grid squre 4107

(j) What is the main mode of irrigation in this region? Give two reasons for the same.

(k) What is the general slope of the region? Give two reasons to justify your answer.

(l) Name two man-made and two natural features in grid squares 4205.

(m) Give the settlement pattern of the following:
(i) Village Padar
(ii) Village Methipura

(n) (i) What is the direction of the flow of Dholva Nadi?
(ii) Give reason.

(o) Express the meaning of 1 : 50,000 printed below the map extract.

(p) What is the general land use of :
(i) uneven ground?
(ii) even ground?

Ans : MAIN 2017

(a) The other methods of representing scale are :
(i) Statement of scale
(ii) Linear or Graphical method

(b) (i) 4311
(ii) 4410
(iii) 3804
(iv) 4206
(v) 4204
(vi) 4004

(c) (i) 386073
(ii) 444109
(iii) 425065
(iv) 428065

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(d) (i) It marks the defined state boundary.
(ii) It represents the contour at an elevation of 400 meters.
(iii) A dry tank with an embankment.
(iv) A pack track.
(v) It indicates the relative depth of a perennial lined well as 22 meters.
(vi) It denotes the triangulation height.
(vii) It represents the relative height of a dry tank with an embankment.

(e) (i) North East
(ii) South West
(iii) South West

(f) (i) 15.5 cm $= \frac{15.5}{2} =$ 7 km 750 m

(ii) 16.2 cm $= \frac{16.5}{2} = 8$ km 100m

(g) No. of Easting = 4
No. of Northing = 2
Area = $4 \times 2 = 8$ sq km.

(h) It indicates that the slope of the land is steep.

(i) (i) Radial
(ii) Dendritic

(j) Well irrigation is the mode of irrigation in this region.
Presence of perennial lined well, regions get seasonal rainfall.

(k) The slope of the land is South West
(i) The arrow indicates that the river Dholva N flows towards the South-West.
(ii) The spot heights are decreasing as we move towards the South-West.

(l) 4205 - Man-made - metalled road, permanent hut.
Natural features - dry streams, dry river bed.

(m) (i) Nucleated
(ii) Linear

(n) (i) South west,
(ii) Presence of arrow in it.

(o) It means 1 unit on the map represents 50,000 units on the ground.

(p) (i) Mining, rearing of cattles.
(ii) Cultivation.

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150. Study map sheet no. G43S7; Eastings 22 to 29, Northings 88 to 98 and answer the following questions : Map 7 (attached at page number 327)

(a) What is the statement of scale of the given map?

(b) Give the four-figure grid references of the following:
(i) Village Bhakar
(ii) Open scrub
(iii) Survey tree 182 in South-Esat
(iv) Village Nilpur

(c) Give the six-figure grid references of the following:
(i) Temple near Bhakar
(ii) Perennial lined well near Nilpur
(iii) Post Office in Dantiwada
(iv) D 168 north of Kheda.

(d) What is the meaning of the following conventional signs:
(i) = = = (Red) along the western margin
(ii) Cluster of brown dots in grid square 2688
(iii) in grid square 2992
(iv) in grid square 2388
(v) in grid square 2589.
(vi) in grid 2993

(e) Give the directions of the following:
(i) Village Godh (2294) from Nandotra Brahmanvas (2794)
(ii) Spot height .172 (2697) from spot height .168 (2396)
(iii) Village Bhakar (2588) from Nilpur (2891)
(iv) Village Kheda (2589) from Nilpur (2891)

(f) Find out the distances between the following:
(i) Direct distance between village Bhakar (2588) and Nilpur (2888)
(ii) Indirect distance in km along the cart-track from village Bhakar (2587) to Mahadevpura (2493).

(g) Calculate the area in square kilometre of the region enclosed by Easting 24 and 29, Northing 89 and 92.

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(h) On which bank of Banas river is village Nandotra (Brahmanvas) located?
(i) What is the main occupation of the people? Give two reasons to justify your answer.
(j) What is the most widespread mode of transport used by the people? Give one reason for the same.
(k) Give the drainage pattern of the following:
(i) In grid square 2992
(ii) In grid square 2897.
(l) Give the settlement patterns of the following:
(i) In grid square 2992
(ii) In grid square 2391.
(m) List two man-made and two natural features in grid square 2588.
(n) (i) What is the mode of irrigation in the region?
(ii) Give reasons.
(o) (i) What type of rainfall is received by the region?
(ii) Give evidence.
(p) Write two man-made features in grid square 2992.
(q) With respect to Banas river answer the following questions:
(i) What is the nature of the river? Give reason.
(ii) State any three features of the river in grid square 2894.
(iii) State direction of its flow.

Ans : SQP 2018

(a) A statement of scale is a type of scale where the relationship between the map distance and the ground distance is expressed in words.
(b) (i) 2588
(ii) 2394
(iii) 2988
(iv) 2891
(c) (i) 254877
(ii) 283904
(iii) 291915
(iv) 259897
(d) (i) Unmetalled Road
(ii) Sand dune.
(iii) Overhead Tank
(iv) Main power lines with pylons surveyed and with poles unsurveyed.
(v) Temple.
(vi) Masonry or rock filled dam.
(e) (i) North West
(ii) North East
(iii) South West
(iv) South West
(f) (i) Nilpur settlement not given in 2888 (question wrong)
(ii) $\frac{10.3}{2} = 5\,\text{km}\ 150\ \text{m}$
(g) No. of easting = 5
No. of Northing = 3
Area = $5 \times 3 = 15$ sq. km
(h) Right bank
(i) Agricultural Reasons: Presence of yellow wash and perennial lined wells.
(j) Cart Tracks: Represented by single red lines, cart tracks connect the villages. There are fewer metalled roads in the area.
(k) (i) Parallel
(ii) Trellised
(l) (i) Linear nucleated
(ii) Linear dispersed
(m) (i) Man made- Metalled Road, permanent hut.
(ii) Natural - (Scattered trees)
(n) (i) Perennial lined well
(ii) Presence of blue dots.
No other perennial source. Other water bodies like streams and rivers are dry.
(o) (i) Seasonal and scanty rain.
(ii) The presence of dry streams and rivers, along with areas of broken ground.
(p) Permanent hut, unmetalled road.
(q) (i) It is seasonal, as it contains a narrow water channel flowing through it.
(ii) The spot heights are decreasing from east to west.
(iii) It flows towards the west.

151. Study the map sheet no. G43S7; Eastings 38 to 45, Northings 85 to 98 and answer the following questions : Map 8 (attached at page number 328)
(a) State the lowest and highest point as

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shown on this map and give the grid numbers also.

(b) What do you mean by form lines?

(c) Give the four-figure grid references of the following:
  (i) Village Bantawada
  (ii) Village Hebatpur
  (iii) Confluence of Balram nadi and Banas river
  (iv) D 217

(d) Give the six-figure grid references of the following:
  (i) Temple near lkhapura
  (ii) ③ 180 near Rampura
  (iii) Prominent surveyed tree in the Karja

(e) What is the meaning of the following conventional signs:
  (i) .10r in grid square 4289
  (ii) Cluster of brown dots in the south
  (iii) in grid square 4088
  (iv) RS in grid square 4485
  (v) BM in grid square 4385
  (vi) Dep in 3890

(f) Give the directions of the following:
  (i) Village Karja (4193) from Amiwada (3993)
  (ii) Village Rampura (4092) from village Karja (4193)
  (iii) Village Rampura (4091) from village Bantawada (4490)

(g) Find out the distances between the following:
  (i) Village Karja (4193) from Amiwada (3993)
  (ii) Village Rampura (4092) from village Karja (4193)

(h) Give two reasons why some of the land in the area shown on the map is not cultivated?

(i) In which quarter do you find the maximum contours in the extract of the toposheet? Give the maximum value of the contour.

(j) Give the settlement patterns of the following:
  (i) In grid square 4193
  (ii) Along the main river.

(k) Give the drainage pattern of the following:
  (i) In grid square 4294
  (ii) In grid square 4087
  (iii) In grid square 3989
  (iv) In grid square 4488

(l) Name two occupations of the people. Give reasons for your answer.

(m) Name two occupations of the people. Give reasons for your answer.

(n) What is the general slope of the area? Give reasons.

(o) What does the number 117 (in red) along the metalled road in grid 4185 indicate?

(p) Identify and name the grid in southern part of the map which has both lined and unlined well.

(q) Name the left bank tributary of the main river also state the direction in which the tributary is flowing.

(r) How is settlement pattern of village Karja (4193) is different from Pirojpura? Give two reasons for the difference.

(s) Give the four figure grid reference of confluence of river Balaram and Banas.

(t) Stream flowing in south-western part of the map extract are disappearing in nature. Give reason.

(u) How are gentle and steep slopes shown on a map?

(v) Name any three prominent features of river you can notice in grid square 4192.

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Ans : MAIN 2013

(a) Lowest 181 m. Grid 3894
Highest 542 m. Grid 4294

(b) These are broken lines that run along the direction of the contours and are used alongside contour lines to represent hilly or mountainous regions. They are less accurate than contour lines and are based on observation rather than precise measurement.

(c) (i) 4490
  (ii) 4385
  (iii) 4292
  (iv) 3890

(d) (i) 381884
  (ii) 399922
  (iii) 419931

(e) (i) The relative height of the sand dune is 10 m

(ii) Sand dunes
(iii) Perennial lined wells
(iv) Railway Station
(v) Bench Marks
(vi) Depression caused by wind erosion.

(f) (i) East
(ii) South west
(iii) North west (Direct Distances)

(g) (i) 5.2 cm $= \frac{5.2}{2} = 2$ km 600 m

(ii) 44 cm $= \frac{4.4}{2} =$ 2 km 200 m.

(h) (i) Steep slope- so it can not be cultivated.
(ii) Absence of perennial lined wells in those areas.
(iii) Also due to presence of broken ground.

(i) NE quarter.
500 m - Maximum value of contour.

(j) (i) Nucleated
(ii) Nucleated

(k) (i) Radial
(ii) Disappearing
(iii) Disappearing
(iv) Rectangular

(l) Agriculture - Yellow Wash
Cattle Rearing - Presence of Open Scrub

(m) Cart track
Metalled Road

(n) East to West
Spot heights are lower from east to west. Contour elevations are also decreasing from east to west.

(o) Milestone
(p) 4286
(q) Balaram Nadi; North west.
(r) Karja - Nucleated
Pirojpura - Linear
(s) 4292
(t) Presence of sand dunes.
(u) Steep - contour lines are close to one another. Gentle - Contour lines are far away from one another.
(v) Perennial stream, island, broken ground.

152. Distinguish between the following :
(i) Trellised and Dendritic drainage
(ii) Gap and pass
(iii) Reserved forest and Protected forest
(iv) P.O. and P.T.O.
(v) D.B. and R.H.
(vi) Dispersed and Nucleated settlements.

Ans : COMP 2005

(i) Trellised and Dendritic drainage :

Trellised drainage	**Dendritic drainage**
A trellised drainage is a rectangular drainage pattern.	A dendritic drainage is a branching tree like drainage pattern.
It is formed by the erosion of the stream on the bands of soft and hard rocks alternatively, having formed a trellis.	It is formed by the action of stream on rocks of equal resistance with little distortion by faulting and floding.
In this pattern, the main river cut across resistant ridges while the tributaries cut into soft rock.	In this pattern the tributaries join the main river at acute angles.
It forms where there are an alternate bands of resistant and less resistant rocks.	It forms where there are relatively uniform surface rockand rather almost a flat relief.

(iii) Gap and Pass :

Gap	**Pass**
A gap is a depression between two summits along a ridge located near to the valley floor.	A pass is a depression been formed between two peaks in a range of mountains.
It is mainly formed by the action of running water.	It is usually formed through the erosion by two streams arisen either sides of a mountain barrier or by glaciers.

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(iii) Reserved forest and Protected forest :

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Reserved forest	Protect forest
The reserved forests are usually meant for its inhabitants.	The protected forests are being usually accomplished to restrain some natural features, such as the shifting of sand dunes nearby the desert area, through are being intended to protect such an effort.
Cutting of trees is prohibited in a reserved forest.	Trees are planted to prevent the soil erosion, acting as a shelter-belt.

(iv) P.O. and P.T.O.

P.O.	P.T.O
P.O. is the indication for the Post-office on a map.	P.T.O. is the indication for the Post and Telegraph Office on a map.

(v) D.B. and R.H. :

D.B.	R.H.
D.B. shows the Dak Bungalow in a map.	R.H. shows the Rest-House on a map.

(vi) Dispersed and Nucleated settlements :

Dispersed settlements	Nucleated settlements
Dispersed settlements are the areas with sparse population and large farm size.	Nucleated settlements are the areas with dense population and productive lands.
These settlements may be found in coastal area, forest and areas vulnerable because of natural calamities.	Trees are planted to prevent the soil erosion, acting as a shelter-belt. These settlements are usually found in fertile plains and valleys.

CASE BASED QUESTION

153. Study the given map extract and answer the following questions :

(i) Find the area in sq. km. of the area enclosed within the Eastings 64 to 64 and Northings 32 to 35.

(ii) Find the compass direction of the following :
(a) Gulabganj from Pamera
(b) Malgaon from Sirori.

(iii) Find the direct distance of the metalled road from the Post Office at Pamera till it intersects with National Highway-NH 168 in grid square 6432.

Ans : COMP 2019

(i) $1 \times 4 = 4$ km^2

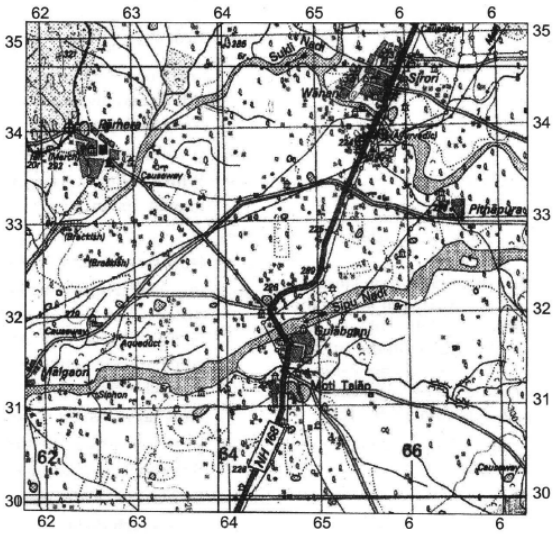
(ii) (a) Gulabganj from Pamero - South East
(b) Malgaon from Sirori - South West

(iii) Distance between two places A and B = 4.6 cm

Given scale is 2 cm = 1 km

1 cm = 0.5 km

4.6 cm = $0.5 \times 4.6 = 2.3$ km



154. The map given below depicts the houses of four friends A, B, C and D. Find the distances using the main road and the kucha road to answer the following questions.

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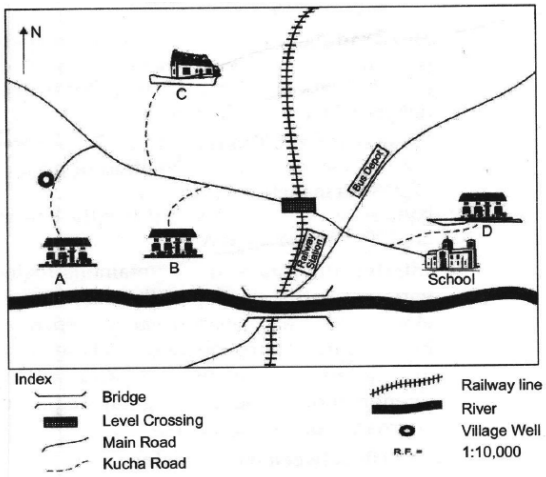

Ans : MAIN 2024

The scale $1 \text{ cm} = 10{,}000 \text{ cm}$

$$1 \text{ cm} = \frac{1000}{10000} \text{ km}$$

$$= \frac{1}{10} \text{ km} = 0.1 \text{ km}$$

or $1 \text{ cm} = 100 \text{ metres}$

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CHAPTER 2

MAP OF INDIA

SUMMARY

The primary purpose of map work in the examination is to assess your understanding of the location of various features on a map of India, such as mountains, plateaus, plains, rivers, water bodies, towns, coastal features, minerals, rainfall patterns, winds and the latitudes and longitudes of India.

1. ASSESSMENT OF LOCATION AND LABELLING

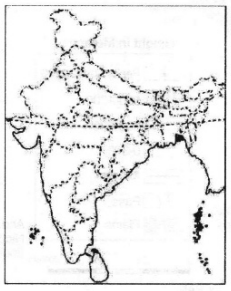
(i) When marking a river on the map, it should closely follow the correct shape of the channel, with the source and mouth accurately indicated at their proper locations.

(ii) The use of appropriate symbols is important, such as a triangle or circle for a National Park, a square for the location of a mineral mine and the symbol || for a dam on a river, among others.

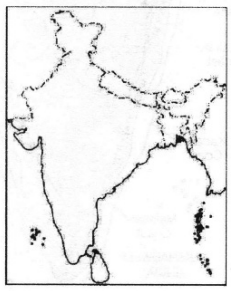
(iii) Neatness of the work.

2. TYPES OF MAPS

India Political Map : These maps are typically used to show political or administrative boundaries of states in India or any country. They may also indicate the locations of major cities. Such maps are commonly used for questions related to the identification, location and labeling of specific features.



INDIA POLITICAL MAP



INDIA OUTLINE MAP

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This type of map is rarely used but is employed to show the flow of a river, areas of crop growth, major soil types, mining centers, the direction of monsoon winds and the physiography of a specific area.

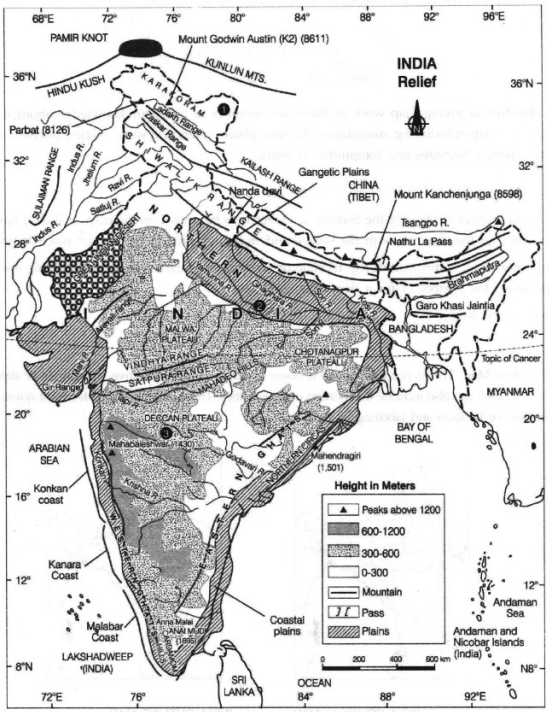
3. MOUNTAIN PEAKS, PASSES AND PLAINS

(i) Mountains : Himalayas, Karakoram, Aravalis, Vindhyas, Satpura, Western and Eastern Ghats, Nilgiri Hills, Garo Hills, Khasi Hills, Jaintia Hills, Mount Godwin Austin (K2), Mount Kanchenjunga.

(ii) Passes : Karakoram Pass, Nathu La Pass.

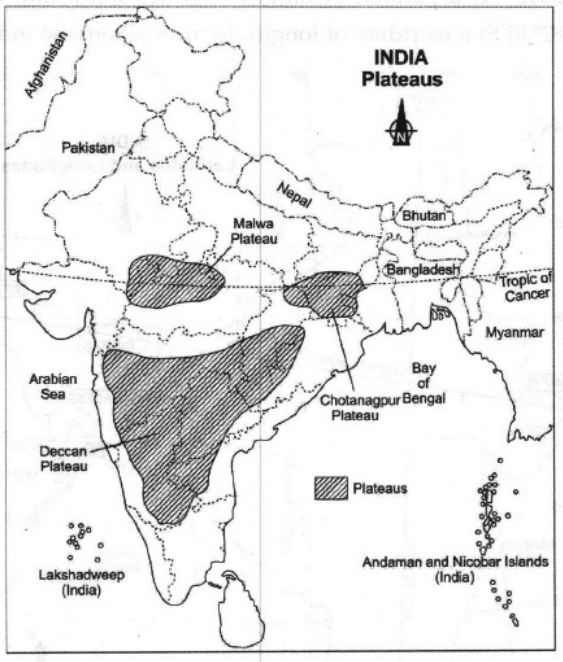
(iii) Plains : Indo-Gangetic Plains, Coastal Plains – Konkan Coast, Kanara Coast, Malabar Coast, Coromandel Coast and the Northern Circars.

(iv) Desert : Thar Desert (The Great Indian Desert).



4. PLATEAUS

Deccan Plateau, Chotanagpur Plateau, Malwa Plateau



Rivers and Water Bodies

(i) Rivers : Indus, Ravi, Beas, Chenab, Jhelum, Satluj, Ganga, Yamuna, Ghaghra, Gomti, Gandak, Kosi, Chambal, Betwa, Son, Damodar, Brahmaputra, Narmada, Tapi, Mahanadi, Godavari, Krishna, Cauvery and Tungabhadra.

(ii) Water Bodies : Gulf of Kutch, Gulf of Khambhat, Gulf of Mannar, Palk Strait andaman Sea, Chilika Lake and Wular Lake.

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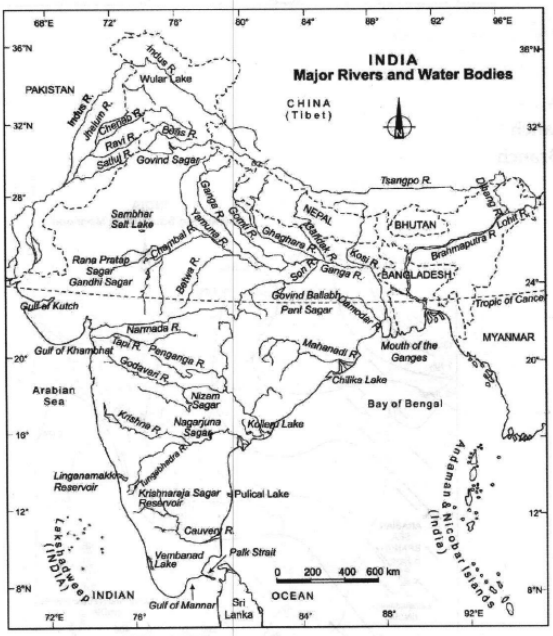
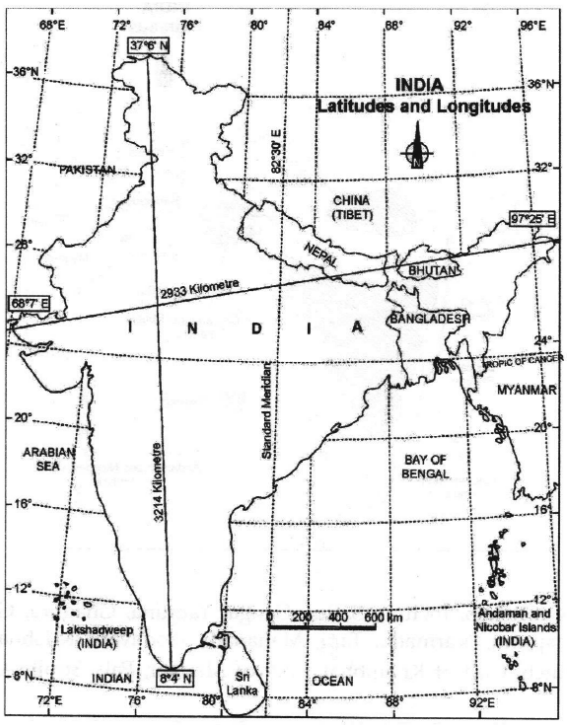


Tropic of Cancer : $(23\frac{1}{2}°\text{N})$ a parallel of latitude divides india into nearly two equal halves.

Standard Meridian : $(80°30'\text{E})$ a meridian of longitude from which the Indian Standard Time (IST) is determined.



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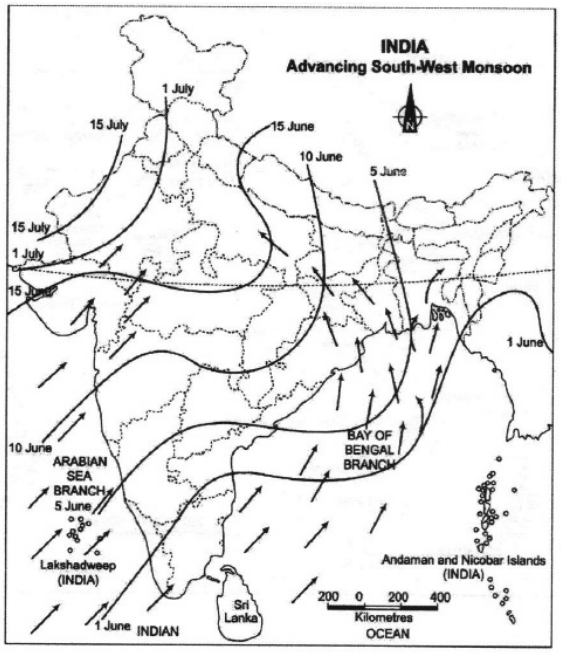
5. DIRECTION OF SOUTH-WEST MONSOON

South-West Monsoon (June to September)

It has two branches :

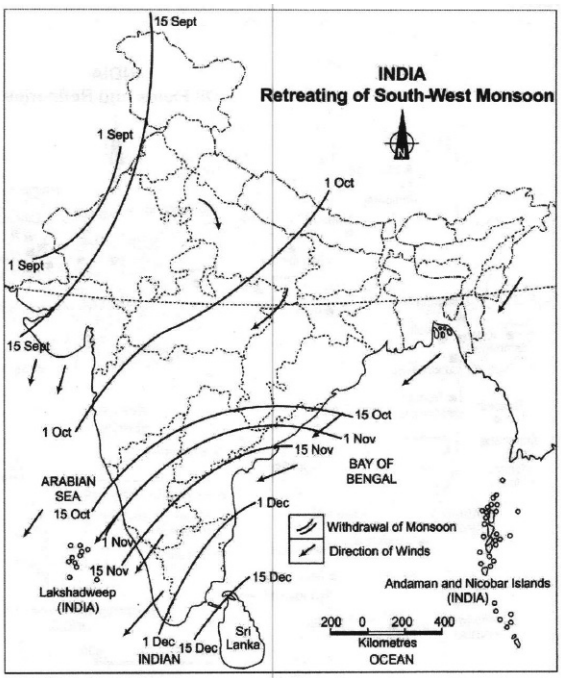
(i) Arabian Sea Branch

(ii) Bay of Bengal Branch



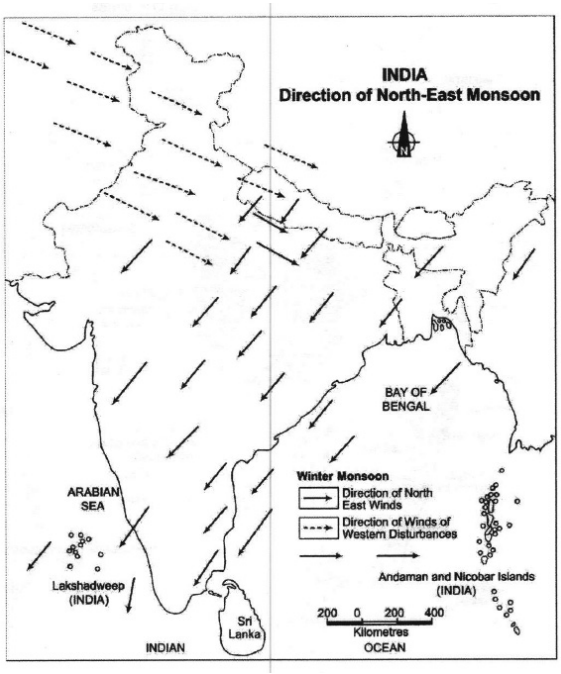
Withdrawal or Retreating of South-West Monsoon

The months of October and November are referred to as the season of the retreating monsoon.



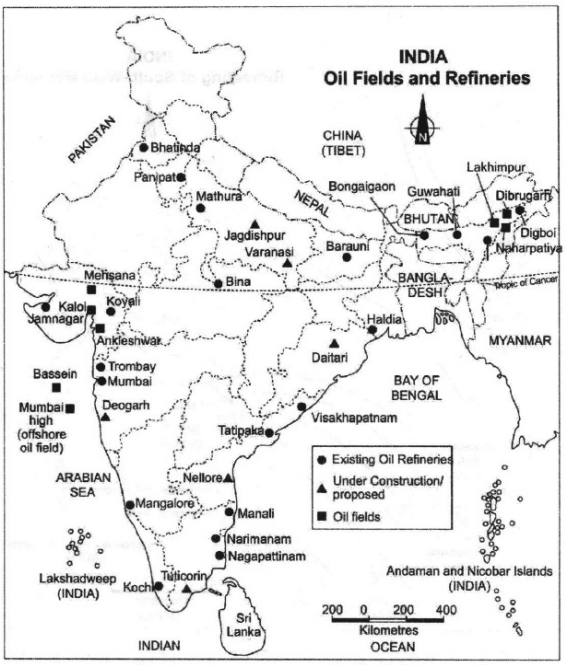
Direction of North-East Monsoon (December to February) and Western disturbances

The North-East Monsoon winds blow from December to February, along with Western disturbances.



6. MINERALS MAP

(i) Oil Fields and Refineries



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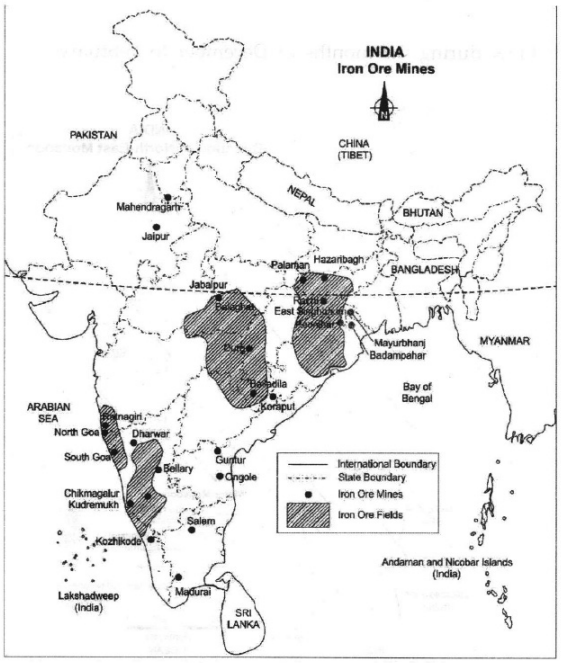
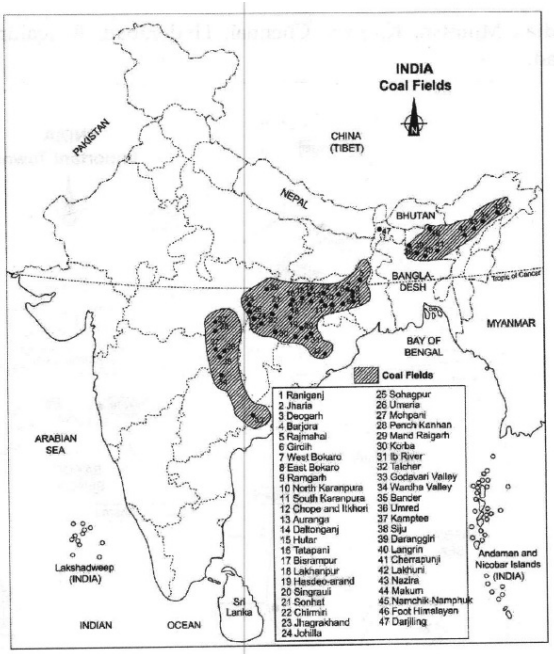
(ii) Iron ore Mines



(iii) Coal Fields



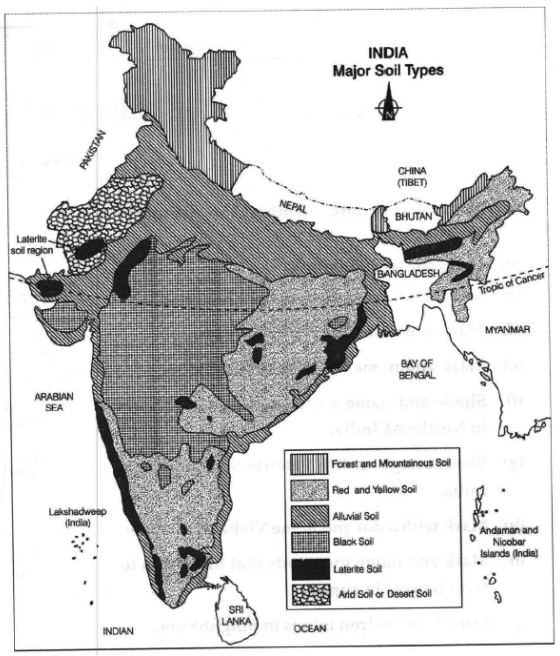
7. MAJOR SOIL DISTRIBUTION

(i) **Alluvial Soils :** Found in Punjab, Haryana, Uttar Pradesh, Bihar, West Bengal, Assam and the Coastal Plains (East and West).

(ii) **Laterite Soils :** Found in Tamil Nadu, Karnataka andhra Pradesh, Assam, the summits of the Eastern Ghats and parts of Odisha.

(iii) **Black Soils :** Found in Maharashtra, Gujarat, Madhya Pradesh andhra Pradesh, the southwestern parts of Chhattisgarh and southeastern Rajasthan.

(iv) **Red and Yellow Soils :** Found in Tamil Nadu, southern Karnataka, Odisha, northeastern Andhra Pradesh, the Chotanagpur Plateau, northeastern regions and parts of Rajasthan.



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TOWN

Delhi (the capital of India), Mumbai, Kolkata, Chennai, Hyderabad, Bengaluru, Kochi, Chandigarh, Srinagar, Visakhapatnam and Allahabad.

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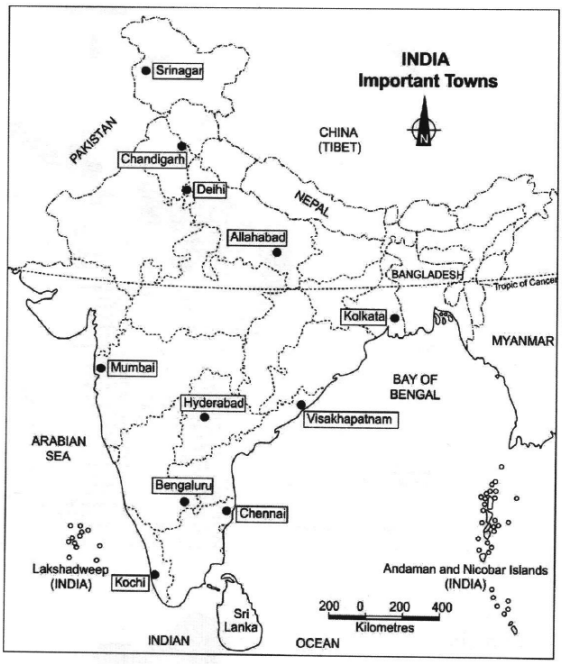

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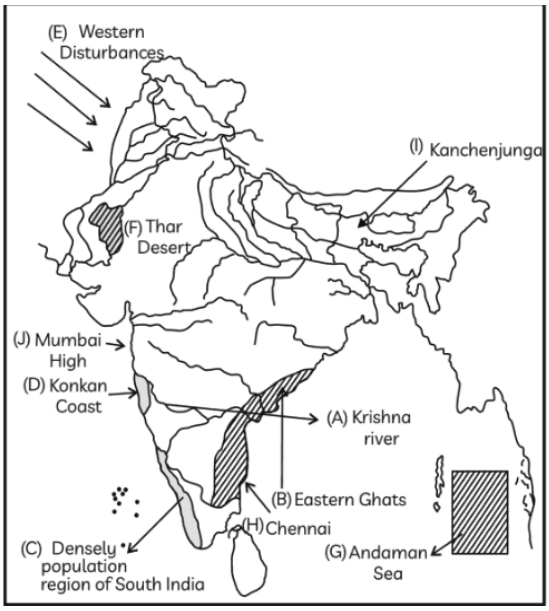
MAP BASED QUESTION

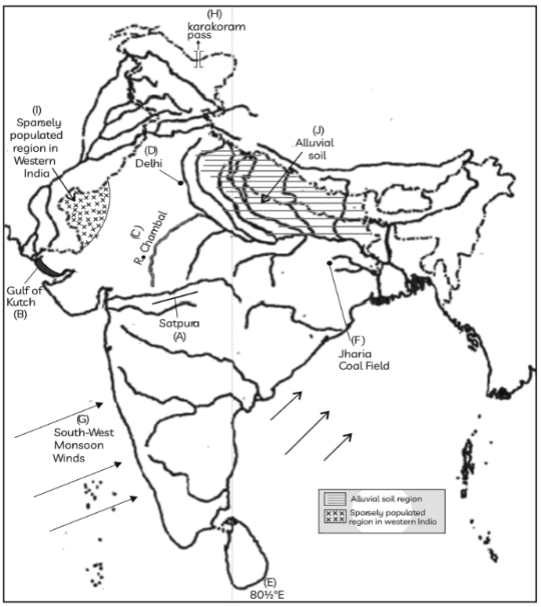
1. On the outline map of India provided:
   (i) Mark and label the river Krishna.
   (ii) Mark and label the Eastern Ghats.
   (iii) Shade and label a densely populated area in the southern part of India.
   (iv) Shade and label the Konkan coastal plain.
   (v) Mark with an arrow and label the direction of western disturbance.
   (vi) Shade and label the Thar Desert.
   (vii) Shade and label the Andaman Sea.
   (viii) Mark and label the city Chennai.
   (ix) Mark and name the highest peak of Himalayas in India.
   (x) Mark and label Mumbai High.

Ans : MAIN 2024



2. On the outline map of India provided:
   (i) Mark and label the Satpura.
   (ii) Shade and label the Gulf of Kutch.
   (iii) Mark and label the River Chambal.
   (iv) Mark and label Delhi.
   (v) Mark and label 80o 30' E longitude.
   (vi) Mark and label Jharia coalfield.
   (vii) Mark with arrows and name the Southwest Monsoon winds.
   (viii) Mark and label the Karakoram Pass.
   (ix) Shade and label a sparsely populated region in Western India.
   (x) Shade an area having Alluvial soil.

Ans : MAIN 2023



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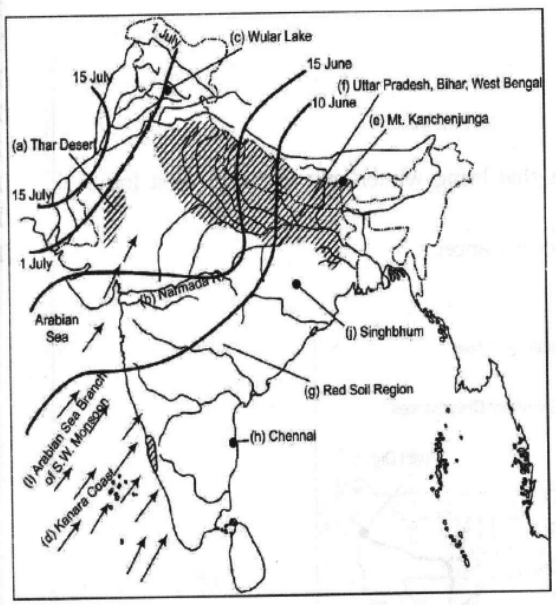
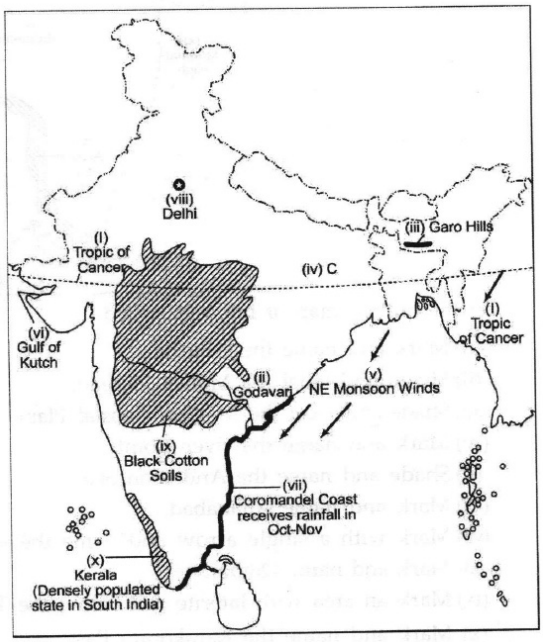
3. On the outline map of India provided
(a) Shade and label Thar Desert.
(b) Label the river Narmada.
(c) Shade and name the Wular lake.
(d) Shade and label Kanara coast.
(e) Mark and name Mount Kanchenjunga.
(f) Shade and label a densely-populated region in India.
(g) Shade and label a region with Red soil in India.
(h) Mark with a dot and name Chennai.
(i) Mark and label the Arabian Sea branch of S.W. Monsoon.
(j) Mark with a dot and name Singhbhum.

Ans : MAIN 2018



4. On the outline map of India provided
(i) Draw and name the Tropic of Cancer.
(ii) Label the river Godavari.
(iii) Mark and name the Garo Hills.
(iv) Mark C on the coal fields of Jharia.
(v) Mark with an arrow and name, the NE monsoon over the Bay of Bengal.
(vi) Shade and name the Gulf of Kutch.
(vii) Shade and name the coastal plain that receives rainfall in October-November.
(viii) Mark with a dot and name Delhi.
(ix) Shade a region with black cotton soil.
(x) Use an arrow to point at a densely populated state in South India.

Ans : MAIN 2017


(viii) Delhi
(iii) Garo Hills
(i) Tropic of Cancer
(iv) C
(vi) Gulf of Kutch
(i) Tropic of Cancer
(ii) Godavari
(v) NE Monsoon Winds
(ix) Black Cotton Soils
(vii) Coromandel Coast receives rainfall in Oct-Nov
(x) Kerala (Densely populated state in South India)

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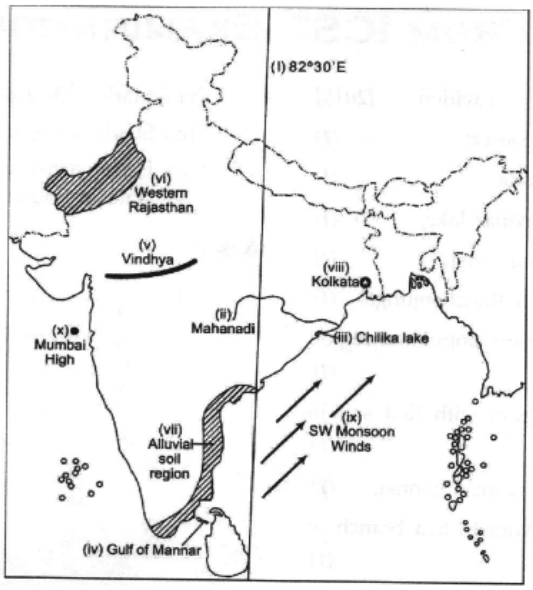
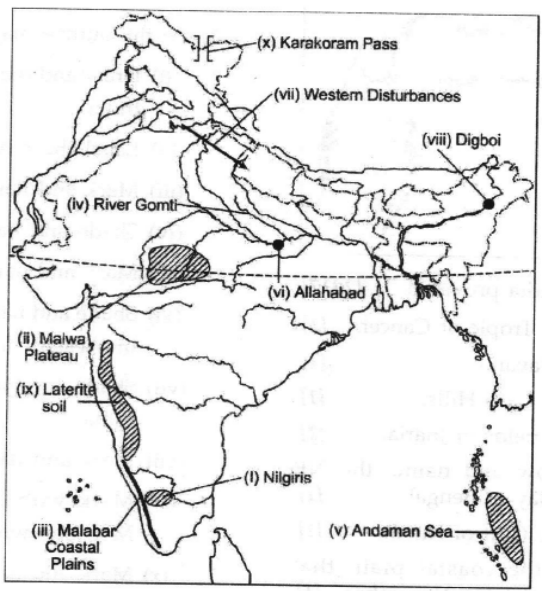
5. On the outline map of India provided
(i) Draw and number the Standard Meridian of India.
(ii) Label the river Mahanadi.
(iii) Mark and name lake Chilika.
(iv) Shade and name the Gulf of Mannar.
(v) Mark and name the Vindhya Mountains.
(vi) Shade and name a sparsely populated region in Western India.
(vii) Shade a region with alluvial soil in South India.
(viii) Mark and name Kolkata.
(ix) Mark with arrows and name South-West Monsoon winds over the Bay of Bengal.
(x) Mark and name Mumbai High.

Ans : MAIN 2016



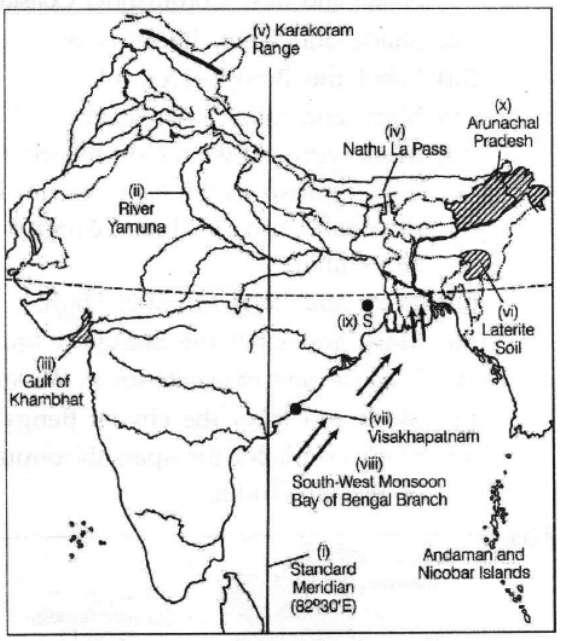
6. On the outline map of India provided
(i) Mark and name the Nilgiris.
(ii) Shade and label the Malwa Plateau.
(iii) Shade and label the Malabar Coastal Plains.
(iv) Mark and name the river Gomti.
(v) Shade and name the Andaman Sea.
(vi) Mark and name Allahabad.
(vii) Mark with a single arrow and name the winds that bring winter rain to North-West India.
(viii) Mark and name Digboi.
(ix) Mark an area with laterite soil below the Tropic of Cancer.
(x) Mark and name the Karakoram Pass.

Ans : MAIN 2015



7. On the outline map of India provided
(i) Draw, name and number the Standard Meridian.
(ii) Label the river Yamuna.
(iii) Shade and name the Gulf of Khambhat.
(iv) Mark and name the Nathu La Pass.
(v) Mark and name the Karakoram Range.
(vi) Shade a region with laterite soil in Eastern India.
(vii) Mark with a dot and name Visakhapatnam.
(viii) Mark and name the wind that brings rain to West Bengal in summer.
(ix) Print S on the iron mine in Singhbhum.
(x) Shade and name a sparsely populated state in North-East India.

Ans : MAIN 2014



8. On the outline map of India provided
(i) Mark the name Chennai.
(ii) Label the river Godavari.
(iii) Shade and label the Chotanagpur Plateau.
(iv) Shade and name the Gulf of Kutch.
(v) Mark and name the Indo-Gangetic Plains.
(vi) Shade and label an area with red soil.
(vii) Mark and name the winds, which bring to Mumbai in July and August.
(viii) Mark and name the Satpura Range.
(ix) Mark and name the Jharia coal field.

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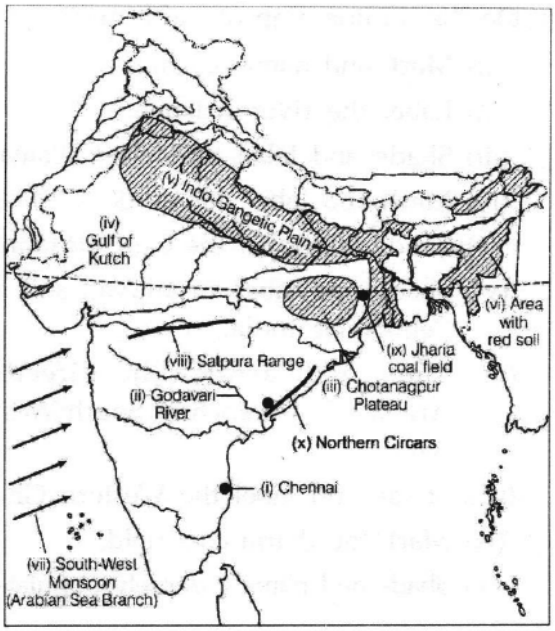
(x) Shade and label the Northern Circars coastal region.

Ans : MAIN 2013



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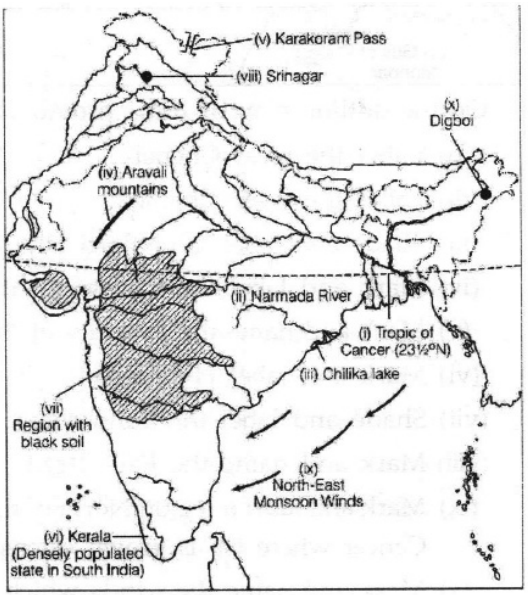
9. On the outline map of India provided
(i) Draw, name and number the Tropic of Cancer.
(ii) Label the river Narmada.
(iii) Shade and name Chilika lake.
(iv) Mark and name the Aravali mountains.
(v) Mark and name the Karakoram Pass.
(vi) Mark and name a densely populated state in South India.
(vii) Shade and name a region with black soil.
(viii) Mark with a dot and name Srinagar.
(ix) Mark and name the winds which bring rain in winter to the Coromandel coast.
(x) Name and print on an oilfield in North-East India.

Ans : MAIN 2012



10. On the outline map of India provided
(i) Label the river Chenab.
(ii) Label the river Chambal.
(iii) Shade and label the Nilgiri Hills.
(iv) Mark and label the Eastern Ghats.
(v) Mark and name the port city of Pakistan.
(vi) Mark and label Hyderabad.
(vii) Shade and label the Sunderbans.
(viii) Mark and name the Palk Strait.
(ix) Mark and label a region North of the Tropic of Cancer where tea is grown extensively.
(x) Mark and name the winds which bring rain to Mumbai in July and August.

Ans : MAIN 2010

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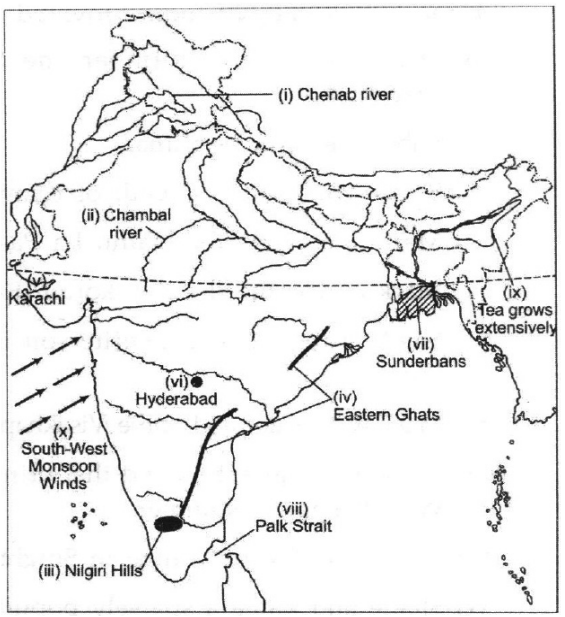
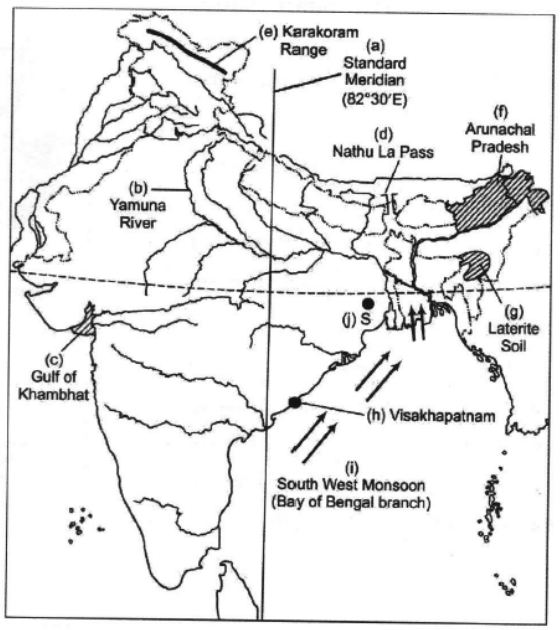


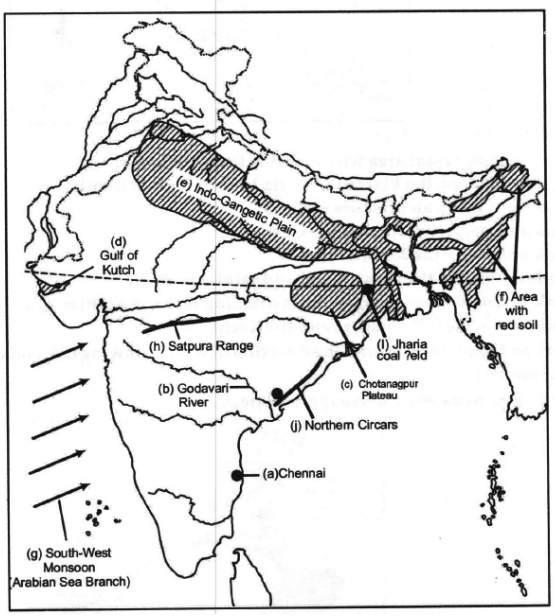
11. On the outline Map of India :
(a) Draw, name and number the Standard Meridian.
(b) Label the river Yamuna.
(c) Shade and name the Gulf of Khambhat.
(d) Mark and name the Nathu-La Pass.
(e) Mark and name the Karakoram Range.
(f) Shade and name a sparsely populated State in Northeast India.
(g) Shade a region with Laterite Soil in Eastern India.
(h) Mark with a dot and name Vishakhapatnam.
(i) Mark and name the winds that bring rain to West Bengal in summer.
(j) Print S on the iron mines in Singhbhum.

Ans :



12. On the outline map of India
(a) Mark and name Chennai.
(b) Label the river Godavari.
(c) Shade and label the Chota Nagpur Plateau.
(d) Shade and name the Gulf of Kachchh.
(e) Mark and name the Indo-Gangetic Plains.
(f) Shade and label an area with Red Soil.
(g) Mark and name the winds which bring rain to Mumbai in July and August.
(h) Mark and name the Satpura Range.
(i) Mark and name the Jharia Coal Field.
(j) Shade and label to Northern Circars coastal region.

Ans :



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13. On the outline Map ot India
(a) Draw, name and number the Tropic of Cancer.
(b) Label the river Narmada.
(c) Shade and name Wular lake.
(d) Mark and name the Aravali Mountains.
(e) Mark and name the Karakoram Pass.
(f) Shade and name a densely populated state in South India.
(g) Shade and name a region with Black Soil.
(h) Mark with a dot and name Chandigarh.
(i) Mark and name the winds which bring rain in winter to the Coromandel Coast.
(j) Name and print S on an oilfield in North-east India.

Ans :

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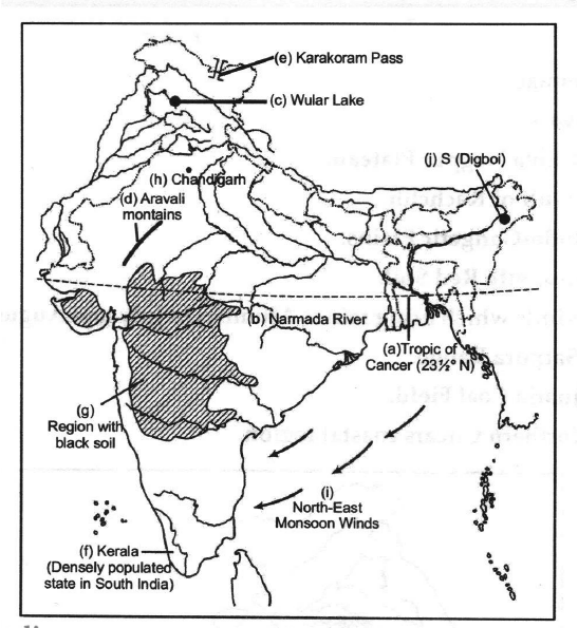
(e) Karakoram Pass
(c) Wular Lake
(j) S (Digboi)
(h) Chandigarh
(d) Aravali montains
(b) Narmada River
(a) Tropic of Cancer (23½° N)
(g) Region with black soil
(i) North-East Monsoon Winds
(f) Kerala (Densely populated state in South India)

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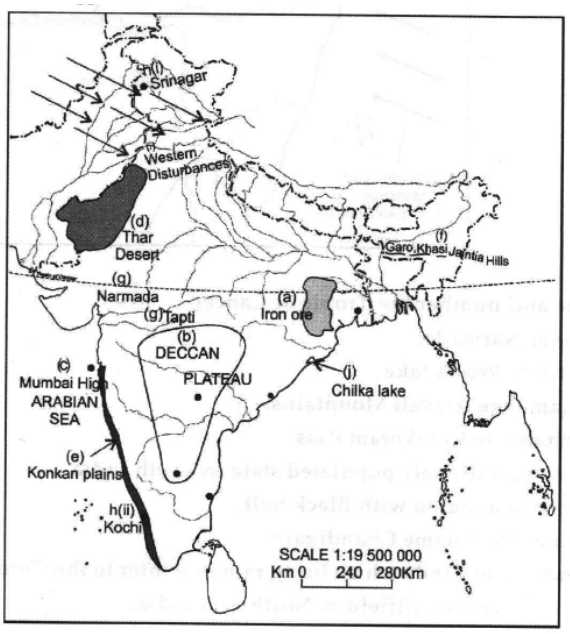

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14. On the outline Map 4 of India :

(a) Shade an important area where Iron is found in India.

(b) Shade and name the Plateau in India known for black soils.

(c) Shade and name an offshore oilfield.

(d) Mark and name Great Indian Desert.

(e) Mark and name the Konkan plains.

(f) Shade and name the Garo, Khasi and Jaintia hills.

(g) Mark and name two rivers in India draining into the Arabian Sea.

(h) Mark and name (i) Srinagar; and (ii) Kochi.

(i) Mark and name with arrows the direction of winds blowing in Kerala during summer season from the Arabian Sea.

(j) Shade and name the Chotanagpur Plateau.

Ans :

15. On the outline map of India provided

(i) Shade and label Coromandel Coastal Plains.

(ii) Shade and label the Himalayas.

(iii) Label the Betwa river.

(iv) Mark and label Palk Strait.

(v) Mark with arrows the direction of the winds which cause cyclones to occur in Andhra Pradesh and Odisha during October- November.

(vi) Mark and label Mumbai High.

(vii) Mark and label the Standard Meridian.

(viii) Shade an area of laterite soil in Western India.

(ix) Mark and label the city of Bengaluru.

(x) Mark and label the sparsely populated state of Western India.

Ans :

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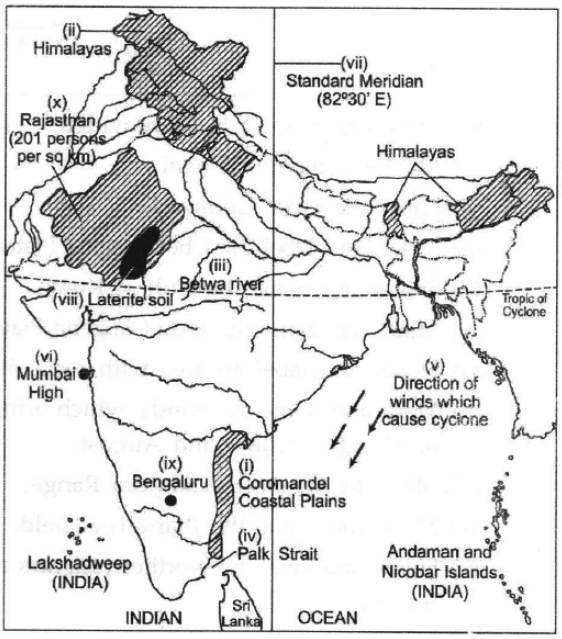

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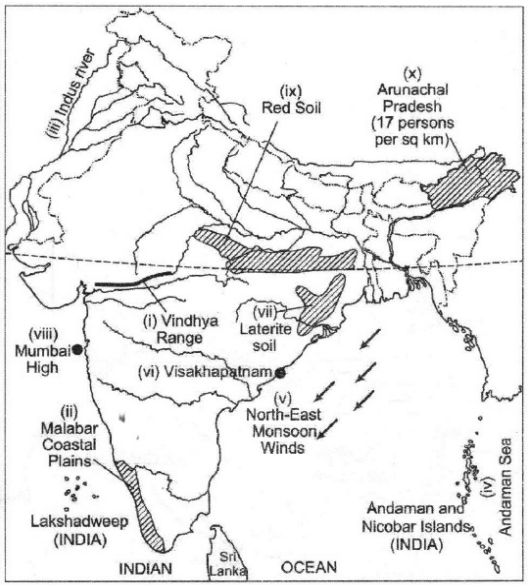
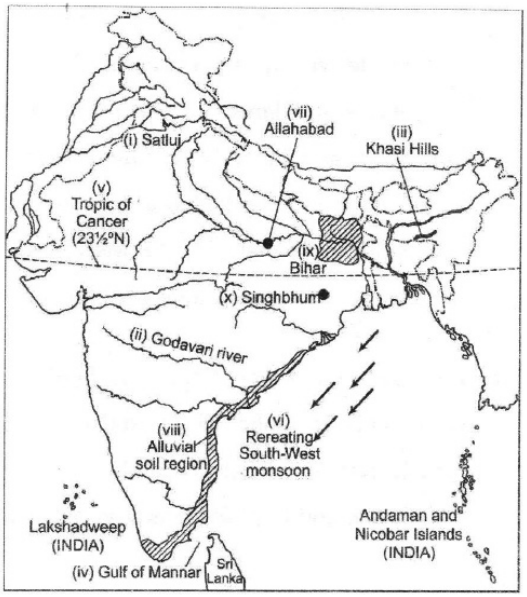
16. On the outline map of India provided
(i) Shade and label Vindhya Range.
(ii) Shade and label Malabar Coastal Plain.
(iii) Shade and label river Indus.
(iv) Mark and label Andaman Sea.
(v) Mark with arrow the North-East monsoon winds.
(vi) Mark and label Visakhapatnam.
(vii) Shade and label an area of laterite soil in South of Tropic of Cancer.
(viii) Mark and label an offshore oil field.
(ix) Shade and label an area of red soil in North of Tropic of Cancer.
(x) Mark and label the state having lowest density in India.

Ans :



17. On the outline map of India provided
(i) Label the river Satluj.
(ii) Label the river Godavari.
(iii) Shade and label the Khasi Hills.
(iv) Label Gulf of Mannar.
(v) Mark and label Tropic of Cancer.
(vi) Mark with arrows the direction of the retreating South-West monsoon.
(vii) Mark and name Allahabad.
(viii) Mark and label an area of alluvial soil in South India.
(ix) Mark and label the state having high density of population.
(x) Mark and label Singhbhum iron ore mine.

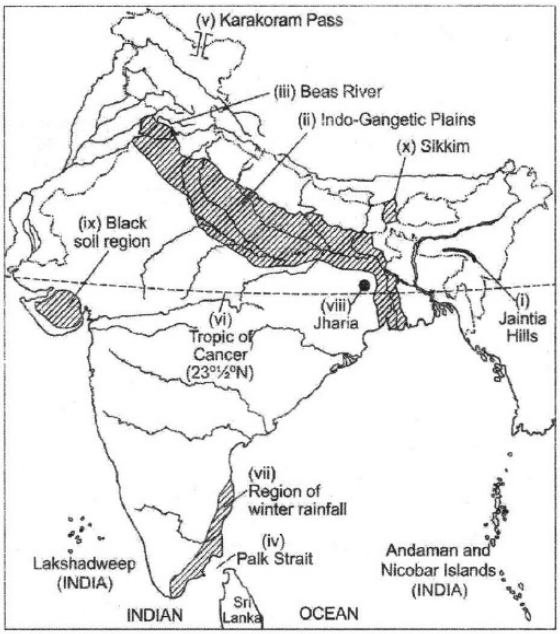
Ans :



NODIA

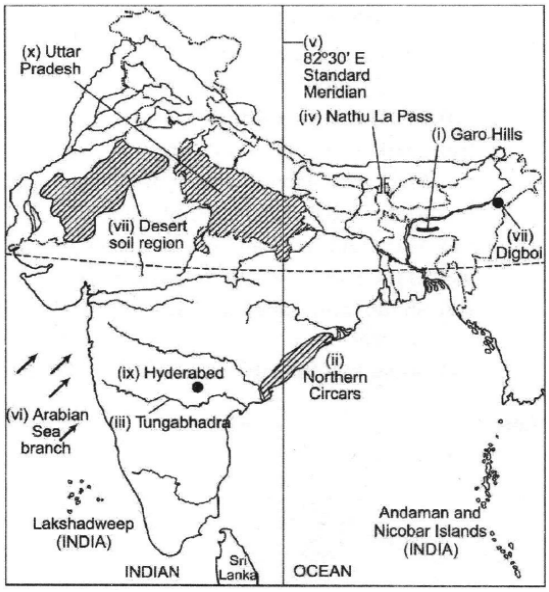
18. On the outline map of India provided
(i) Shade and label Jaintia Hills.
(ii) Shade and label Indo-Gangetic Plains.
(iii) Mark and label Beas river.
(iv) Mark and label Palk Strait.
(v) Mark and label Karakoram Pass.
(vi) Mark and label Tropic of Cancer.
(vii) Mark and label an area of winter rainfall.
(viii) Mark and locate Jharia coal field.
(ix) Shade and label an area of black soil in Gujarat state.
(x) Locate and label the sparsely populated state.

Ans :



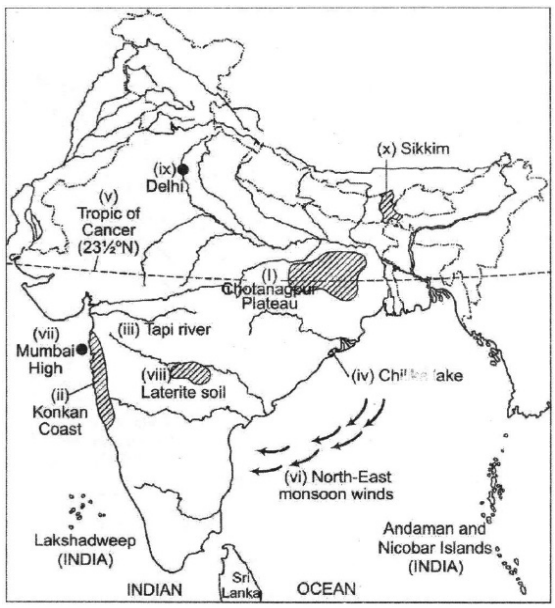
19. On the outline map of India provided
(i) Shade and label Garo Hills.
(ii) Shade and label Northern Circars.
(iii) Mark and label river Tungabhadra.
(iv) Locate and label Nathu La Pass.
(v) Mark and label 82°30′E Meridian.
(vi) Mark and locate monsoon winds of Arabian Sea branch.
(vii) Locate and label Digboi oil field.
(viii) Shade and label Desert soil region.
(ix) Locate and label Hyderabad.
(x) Shade and label the largest populated state.

Ans :



20. On the outline map of India provided
(i) Shade and label Chotanagpur Plateau.
(ii) Mark and label Konkan Coast.
(iii) Mark and label Tapi river.
(iv) Locate and label Chilika lake.
(v) Locate and label $23\frac{1}{2}$°N Parallel.
(vi) Mark and label the North-East monsoon winds.
(vii) Mark and label an offshore oil field.
(viii) Shade and label an area of laterite soil in the Central India.
(ix) Locate and label Delhi.
(x) Locate and label sparsely populated state.

Ans :



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CHAPTER 3

LOCATION, EXTENT AND PHYSICAL FEATURES

SUMMARY

India is the largest country in the Indian subcontinent, named after the Indus River, which flows through its northwestern region.

1. LOCATION

India is a vast country located in the Northern Hemisphere. Its mainland spans between specific latitudes 8°44′N and 37°6′N and longitudes 68°7′E. The Tropic of Cancer (23°30′N) divides the country into nearly two equal halves and passes through the states of Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, West Bengal, Tripura and Mizoram. India is also home to two groups of islands: the Andaman and Nicobar Islands in the Bay of Bengal (southeast of the mainland) and the Lakshadweep Islands in the Arabian Sea (southwest of the mainland).

2. SIZE AND EXTENT

India covers a land area of 3.287 million sq. km, which accounts for 2.4% of the world's total geographical area. It is the 7th largest country in the world, following Russia, Canada, the USA, China, Brazil and Australia. India has a land boundary that stretches over 15,200 km and its coastline is approximately 7,516.6 km long.

The latitudinal and longitudinal extent of the mainland is considerable, even though the East-West span appears smaller than the North-South span. The country's latitudinal extent affects the duration of day and night as one moves from south to north.

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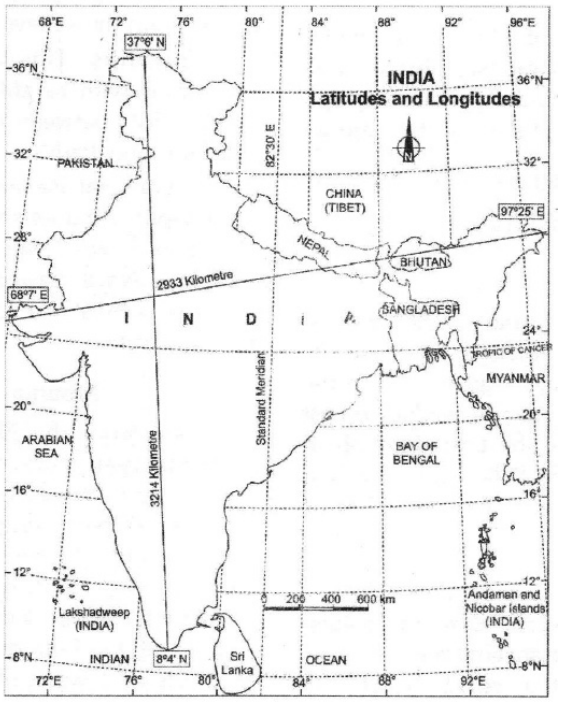

India : Size and Extent

Important Facts about India

Total Area	3.287 million km^2
Latitude	8°44′N to 37°6′N
Longitude	68°7′E to 97°25′E
North to South Extent	3214 km
East to West Extent	2933 km
Main Land Coastline	6100 km
Total Coastline	7516.6 km
Land Boundary	15200 km
Northern Most Point	Indira Col, Siachen Glacier J&K

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Southern Most Point	Indira point (Great Nicobar) that got submerged under Indian Ocean in 2004 during the Tsunami.
Western Most Point	Guhar Moti (Gujarat)
Eastern Most Point	Kibithu (Arunachal Pradesh)
Higher Altitude	K_2 (Godwin Austin)
Lowest Altitude	Kuttanad (kerala)
Territorial Sea	12 nm (22.2 km)
State having longest Coastline	Gujarat (1214.70 km)
State having Shortest Coastline	Goa (160.5 km)

2.1 Indian Standard Time (IST)

There is a time difference of nearly two hours between Gujarat and Arunachal Pradesh. Therefore, the time along the Standard Meridian of India, passing through Mirzapur (Uttar Pradesh), is used as the Indian Standard Time (IST) for the entire country. IST is 5 hours and 30 minutes ahead of Greenwich Mean Time (GMT).

2.2 India and Adjacent Countries

India is the most prominent country in South Asia, consisting of 29 states and 7 Union Territories. It shares land boundaries with Pakistan and Afghanistan to the North-West, China, Nepal and Bhutan to the North-East and Myanmar and Bangladesh to the East. To the South, across the Indian Ocean, lie two island nations: Sri Lanka (separated by the Palk Strait and Gulf of Mannar) and the Maldives.

2.3 India and the World

India's strategic position in the world is due to its proximity to the Indian Ocean, its central location and the southward extension of its landmass in Asia. The Deccan Peninsula, which juts into the Indian Ocean, enables India to maintain close contact with West Asia, Africa and Europe from the western coast and with Southeast and East Asia from the eastern coast.

3. PHYSICAL FEATURES OF INDIA

The physical features of India can be classified into the following physiographic divisions:

3.1 The Himalayan Mountains

The Himalayas, geologically young and structurally fold mountains, run in West-East direction from the Indus to the Brahmaputra. They are the longest range in India, covering an area of about 2400 km. Their width varies from 400 km in Kashmir to 150 km in Arunachal Pradesh.

Himachal or Lesser Himalayas or Western Himalayas

The range south of the Himadri is the most rugged, with heights of 3,700 to 4,500 m and a width of 50 km, including the Pir Panjal, Dhaula Dhar and Mahabharat ranges, along with valleys like Kashmir and Kangra. The Shivaliks, the outermost range, have heights between 900 and 1,100 m and widths from 10 to 50 km, with valleys such as Dehradun and Patlidun. The Purvanchal Range, or Eastern Himalayas, extends south from the Brahmaputra, including the Patkali, Naga, Manipur and Mizo hills.

3.2 Mountains and Hill Range

India has mountain ranges beyond the Himalayas, including the Aravallis in the west, Vindhyas and Satpura in central India, Western Ghats along the western coast, Eastern Ghats along the eastern coast and the Nilgiri Hills at their confluence.

1. The Northern Plains

This plain, formed by the Indus, Ganga and Brahmaputra rivers and their tributaries, consists of alluvial soil and covers 7 lakh sq km. It stretches about 2,400 km long and 240 to 320 km wide. The fertile soil, ample water supply, favorable climate and terrain make it densely populated. Rivers from the northern mountains slow down due to gentle slopes, creating riverine islands, with Majuli

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being the largest inhabited river island in the world, located in the Brahmaputra. In their lower courses, rivers split into distributaries due to silt deposition, a common feature in river deltas.

Parts of Northern Plain

The three parts of the Northern plains are:

(i) **Punjab Plain :** The western part of the plain, formed by the Indus and its tributaries (Jhelum, Ravi, Sutlej, Beas and Chenab), mainly lies in Pakistan and is marked by doabs, areas between two rivers.

(ii) **Ganga Plain :** The middle part of the plain extends from the Ghaggar River (Haryana) to the Tista River (West Bengal), covering several states including Haryana, Delhi, Uttar Pradesh, Bihar, Jharkhand and West Bengal.

(iii) **Brahmaputra Plain :** It is the Eastern part of the plain.

Regions of Northern Plain

Along its width, the Northern plain is divided into four regions according to variation in relief feature which are as follows :

(i) **Bhabar :** Rivers deposit pebbles in the 8-16 km wide bhabar belt along the Shiwalik slopes, where they disappear.

(ii) **Terai :** South of the bhabar belt, the Terai region is wet and swampy, once forested but now cleared for agriculture and settlements. Dudhwa National Park remains here.

(iii) **Bhangar :** The bhangar, the largest part of the Northern plain, consists of older alluvium with terraces and calcareous kankar deposits.

(iv) **Khadar :** The soil here is refreshed by annual floods, making it fertile and ideal for intensive agriculture.

2. The Peninsular Plateau

This tableland, formed from ancient crystalline, igneous and metamorphic rocks, originated from the break-up of Gondwana land. It features broad, shallow valleys and rounded hills. This plateau consists of two broad divisions. These are:

(i) **Central Highlands :** North of the Narmada, the Malwa plateau is bordered by the Vindhyan range and the Aravallis. It slopes from southwest to northeast, with rivers like Chambal and Betwa flowing in that direction. The Central Highlands are wider in the west and narrower in the east, including Bundelkhand and Baghelkhand, with the Chotanagpur plateau marking the eastern extension.

(ii) **Deccan Plateau :** South of the Narmada, this triangular landmass is bordered by the Satpura range, Mahadeo, Kaimur and Maikal hills. The Deccan plateau slopes eastward, extending into the Meghalaya Karbi-Anglong plateau and North Cachar hills, separated from the Chotanagpur plateau by a fault. Key hill ranges include the Garo, Khasi and Jaintia hills.

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3.3 Western and Eastern Ghats

The Western and Eastern Ghats mark the edges of the Deccan plateau. The Western Ghats, also known as the Sahyadri range, are higher (900-1600 m) than the Eastern Ghats (600 m). They cause orographic rainfall by forcing monsoon winds to rise along their slopes. The Western Ghats, with peaks like Anai Mudi (2695 m) and Doda Betta (2637 m), are continuous and crossed only through passes. The Eastern Ghats, stretching from the Mahanadi valley to the Nilgiris, are discontinuous and dissected by rivers. Mahendragiri (1501 m) is the highest peak here, with the Nilgiri hills at the junction of both ranges.

1. Deccan Trap

The western part of the plateau, known as the Deccan Trap, contains black soil of volcanic origin. These igneous rocks have eroded to form fertile black soil, which is ideal for cotton cultivation.

2. The Indian Desert

The Thar Desert, on the western margins of the Aravalli hills, has sandy plains, Barchan dunes and receives less than 150 mm of rainfall annually. It has an arid climate, low vegetation and only seasonal streams. Luni is

the main river, with longitudinal dunes near the Indo-Pakistan border.

3.4 The Coastal Plains

The Peninsular plateau is bordered by narrow coastal strips running along the Arabian Sea on the West and the Bay of Bengal on the East. The Western coast which lies between the Western Ghats and Arabian sea, is a narrow plain. It consists of three sections:

(i) Northern part of the coast is called the Konkan (Mumbai-Goa)

(ii) Central stretch is called the Kannad plain.

(iii) Southern stretch is called as Milabar coast.

The Bay of Bengal plains are wide and level, known as the Northern Circar in the north and the Coromandel Coast in the south. Rivers like Mahanadi, Godavari, Krishna and Kaveri form deltas and Lake Chilika, the largest saltwater lake, lies south of the Mahanadi Delta.

3.5 The Islands

India has two island groups. These are:

(i) The Lakshadweep island group, near the Malabar coast of Kerala, consists of small coral islands. Previously known as Laccadive, Minicoy and Amindive, they were renamed Lakshadweep in 1973, covering 32 sq. km. Kavaratti is the administrative headquarters and Pitti Island has an uninhabited bird sanctuary.

(ii) The Andaman and Nicobar Islands consist of two chains of forested islands, with the Andamans larger and more numerous. Divided into the northern Andamans and southern Nicobars, these islands are believed to be parts of submarine mountains. Indira Point, the southernmost tip, lies farther south than the Indian mainland.

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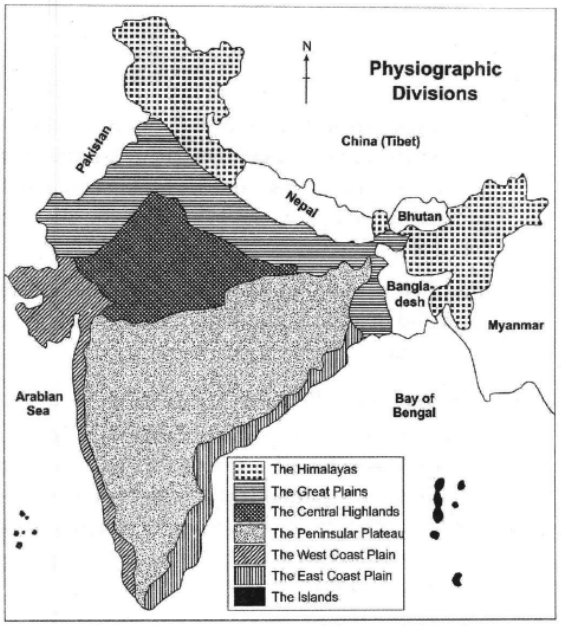

3.6 Rivers of India

In India, rivers are basically classified into Himalayan rivers and Peninsular rivers. These are explained below:

1. The Himalayan Rivers :

(i) **The Indus River System :** The Indus River originates in China (Tibet) near Mansarovar Lake, flowing northwest into India's Ladakh district. The Sutlej, Beas, Ravi, Chenab and Jhelum rivers join the Indus near Mithankot in Pakistan.

(ii) **The Ganga River System :** The Ganga system begins as the Bhagirathi, fed by the Gangotri glacier in Uttarakhand. It merges with the Alaknanda at Devaprayag to form the Ganga, which is 2,500 km long. Its major tributaries include the Yamuna, Ghaggar, Gandak, Kosi, Son, Chambal and Betwa.

(iii) **The Brahmaputra River System :** The Tsang Po (Brahmaputra) river originates in Tibet, east of Lake Mansarovar and flows eastward parallel to the Himalayas. It then takes a 'U' turn at Namcha Barwa and enters India in Arunachal Pradesh, where it is called the Dihang. It is

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slightly longer than the Indus, with most of its course outside India.

2. The Peninsular River : The rivers in Peninsular India is divided into West flowing and East flowing rivers:
   (i) The West Flowing Rivers : These rivers are fewer in number and do not form deltas, flowing into the Arabian Sea. The Narmada, rising in the Amarkantak hills of Madhya Pradesh, forms an estuary near Bharuch in Gujarat before reaching the Arabian Sea.
   (ii) The East Flowing Rivers :
      (a) **The Godavari Basin :** The Godavari, known as the 'Dakshin Ganga,' is the largest Peninsular river. It rises in the Western Ghats in Nasik, Maharashtra and flows through Maharashtra, Madhya Pradesh, Odisha and Andhra Pradesh.
      (b) **The Mahanadi Basin :** The Mahanadi rises in the highlands of Chhattisgarh and flows through Odisha to reach the Bay of Bengal.
      (c) **The Krishna Basin :** The Krishna River rises near Mahabaleshwar in Maharashtra, flowing about 1,400 km before forming a large delta at the Bay of Bengal. Its important tributary is the Tungabhadra.
      (d) **The Kaveri Basin :** The river rises in the Brahmagiri range of the Western Ghats and flows 760 km into the Bay of Bengal, south of Cudalore, Tamil Nadu.

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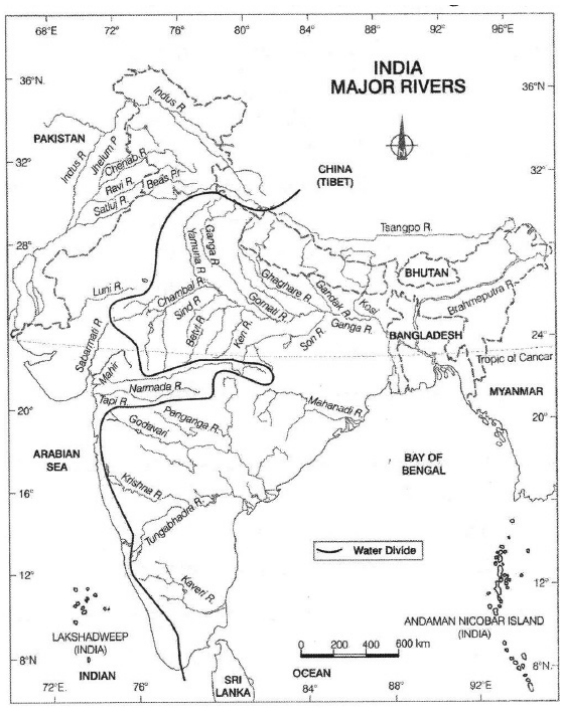

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MULTIPLE CHOICE QUESTION

Mount Kanchenjunga, the third-highest mountain in the world, is located in which state?
(a) Sikkim
(b) Uttarakhand
(c) Jammu & Kashmir
(d) Himachal Pradesh

Ans : MAIN 2024

Thus (a) is correct option.

2. Which mountain range runs parallel to the western coast of India?
(a) Aravalis
(b) Western Ghats
(c) Eastern Ghats
(d) Satpura Range

Ans : MAIN 2024

Thus (b) is correct option.

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3. Which of the following is the southernmost point of India?
(a) Kanyakumari
(b) Indira Point
(c) Cape Comorin
(d) Andaman Islands

Ans : MAIN 2012

Thus (b) is correct option.

4. India is located in which hemisphere?
(a) Northern Hemisphere only
(b) Southern Hemisphere only
(c) Eastern Hemisphere only
(d) Northern and Eastern Hemispheres

Ans : SQP 2022

Thus (d) is correct option.

5. The Tropic of Cancer passes through which of the following states in India?
(a) Gujarat
(b) Madhya Pradesh
(c) Rajasthan
(d) All of the above

Ans : COMP 2002

Thus (d) is correct option.

6. What is the total length of India's coastline?
(a) 6,100 km
(b) 7,517 km
(c) 8,100 km
(d) 4,500 km

Ans : MAIN 2004

Thus (b) is correct option.

7. India's geographical extent from north to south is approximately:
(a) 3,200 km
(b) 2,933 km
(c) 3,700 km
(d) 4,000 km

Ans : SQP 2022

Thus (b) is correct option.

8. India is bounded by which ocean in the south?
(a) Atlantic Ocean
(b) Arctic Ocean
(c) Indian Ocean
(d) Pacific Ocean

Ans : COMP 2003

Thus (c) is correct option.

9. Which of the following is the easternmost point of India?
(a) Kibithu
(b) Kanyakumari
(c) Naga Hills
(d) Darjeeling

Ans : MAIN 2011

Thus (a) is correct option.

10. The westernmost point of India lies in which state?
(a) Gujarat
(b) Maharashtra
(c) Rajasthan
(d) Kerala

Ans : COMP 2019

Thus (a) is correct option.

11. Which of the following is the highest mountain range in India?
(a) Western Ghats
(b) Eastern Ghats
(c) Himalayas
(d) Aravalis

Ans : MAIN 2001

Thus (c) is correct option.

12. Which mountain range separates the states of Haryana and Rajasthan from Gujarat?
(a) Aravalis
(b) Vindhyas
(c) Satpura Range
(d) Eastern Ghats

Ans : SQP 2023

Thus (a) is correct option.

13. The Nanda Devi peak is located in which part of India?
(a) Jammu and Kashmir
(b) Himachal Pradesh
(c) Uttarakhand
(d) Arunachal Pradesh

Ans : SQP 2022

Thus (c) is correct option.

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14. The mountain range known for its famous passes like Nathu La and Bomdila is:
(a) Aravalis
(b) Himalayas
(c) Western Ghats
(d) Eastern Ghats

Ans : COMP 2020

Thus (b) is correct option.

15. The Deccan Plateau is mainly located in which part of India?
(a) Northern India
(b) Western India
(c) Southern India
(d) Eastern India

Ans : SQP 2019

Thus (c) is correct option.

16. Which of the following plateaus is found in the central part of India?
(a) Chota Nagpur Plateau
(b) Malwa Plateau
(c) Deccan Plateau
(d) Rajasthan Plateau

Ans : COMP 2018

Thus (b) is correct option.

17. The Chota Nagpur Plateau is known for its richness in which resource?
(a) Gold
(b) Coal
(c) Salt
(d) Iron

Ans : SQP 2014

Thus (b) is correct option.

18. The Gangetic Plains are characterized by which type of soil?
(a) Laterite soil
(b) Alluvial soil
(c) Black soil
(d) Red soil

Ans : MAIN 2013

Thus (b) is correct option.

19. The river Brahmaputra flows into which body of water?
(a) Bay of Bengal
(b) Arabian Sea
(c) Indian Ocean
(d) Gulf of Mannar

Ans : MAIN 2021

Thus (a) is correct option.

20. Which of the following rivers does not flow into the Bay of Bengal?
(a) Ganga
(b) Godavari
(c) Narmada
(d) Mahanadi

Ans : SQP 2020

Thus (c) is correct option.

ONE MARK QUESTIONS

21. During which part of the year is the rain experienced?

Ans : SQP 2024

June to September

22. Name one part of India that has its rainfall in winter and summer as well.

Ans : COMP 2024

Cherrapunjee

23. Name the regions receiving less than 20 cm of annual rainfall.

Ans : MAIN 2003

Regions receiving less than 20 cm of annual rainfall include the Thar Desert, parts of the Kutch region in Gujarat and the Ladakh region in Jammu and Kashmir.

24. Which are winds responsible for the rain experienced over the greater part of the subcontinent?

Ans : SQP 2008

The South-West Monsoon winds are responsible for the rain experienced over the greater part of the subcontinent.

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25. Name the winds that bring rain to the Tamil Nadu coast.

Ans : SQP 2004

North-East Monsoon winds

26. Name the river that divides the Peninsular Plateau of India into two parts.

Ans : MAIN 2019

Narmada River

27. Name the two parts of the Peninsular plateau of India.

Ans : COMP 2017

1. The Central Highlands
2. The Deccan Plateau

28. State the location of the Great Indian Desert.

Ans : SQP 2007

The Great Indian Desert is located at the Western part of the Aravalli Range.

29. Name one important river of the Great Indian Desert.

Ans : MAIN 2020

Luni River

TWO MARKS QUESTIONS

30. Name the source of winter rain in Tamil Nadu. How does Tamil Nadu benefit from it?

Ans : MAIN 2008

(i) The North-East Monsoon winds are the primary source of winter rainfall in Tamil Nadu.
(ii) This rainfall benefits winter crops such as tea, coffee and groundnut and plays a crucial role in supporting agriculture in the region, ensuring good yields and helping maintain soil fertility.

31. What is meant by a 'rain shaodw' area ? Give an example and state the mountains responsible for the rain shadow area ?

Ans : SQP 2002

A rain shadow area is a region that receives little rainfall due to mountains blocking the moist air. As the air rises over the mountains, it loses moisture on the windward side, leaving the leeward side dry.
Example: The Deccan Plateau on the leeward side of the Western Ghats experiences this effect, receiving little rainfall due to the blocking of monsoon winds.

32. What do you understand by the "retreat of mon-soons"? What are the important atmospheric conditions that leads to this phenomenon ?

Ans : COMP 2012

The retreating monsoons mark a transitional period between the monsoon and winter seasons. During this time, several atmospheric conditions contribute to the change in weather :
(i) The apparent southward movement of the sun leads to a gradual decrease in temperatures, signaling the onset of cooler weather.
(ii) The weakening of the low-pressure belt over northern India further contributes to the reduction in moisture and the retreat of the monsoon winds.

33. Explain how is the winter rain caused ? How is this rain beneficial ?

Ans : MAIN 2002

Winter rain is primarily caused by monsoon winds that flow from high-pressure to low-pressure regions, bringing moisture and resulting in precipitation. This rain plays a crucial role in supporting seasonal crops by providing the necessary moisture for their growth, improving soil fertility and boosting agricultural yields. It is particularly vital for crops like wheat and barley, grown during the winter season.

34. Name the months during which the following occur :
(i) Kalbaisakhi
(ii) Mango Showers.

Ans : SQP 2008

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(i) Kalbaisakhi: Kalbaisakhi typically occurs during the months of April and May, bringing sudden thunderstorms to eastern India, especially West Bengal and Assam.
(ii) Mango Showers: Mango Showers generally occur during April and May in southern India, providing much-needed rainfall that helps in the ripening of mangoes.

35. What is the chief characteristics features of the tropical monsoon type climate ?

Ans : COMP 2008

The tropical monsoon climate is primarily characterized by variations in rainfall and distinct climatic contrasts. These contrasts include significant differences between the wet and dry seasons, as well as variations in rainfall distribution across regions. The heavy, concentrated rainfall during the monsoon season contrasts sharply with the dry conditions of the rest of the year. This climate also experiences seasonal temperature fluctuations, with hot summers and mild winters adding to its unique character.

36. Name the most important tree found :
(i) At the foothills of Himalayas.
(ii) In the Sunderbans.

Ans : MAIN 2007

(i) Sal tree (Shorea robusta) is the most significant tree found in the foothills of the Himalayas, known for its durable timber and ecological importance.
(ii) The Sundari tree (Heritiera fomes), after which the Sunderbans are named, is the most prominent tree in this region, thriving in the unique mangrove ecosystem.

37. Give two differences between the Eastern Coastal Plains and the Western Coastal Plains.

Ans : SQP 2022

Feature	**Eastern Coastal Plains**	**Western Coastal Plains**
Location	Lies between the Bay of Bengal and the Eastern Ghats.	Lies between the Arabian Sea and the Western Ghats.
Rivers	Characterized by large river deltas.	Marked by estuaries and lagoons.

38. What kind of mountains are the Himalayas? By what name are the offshoots of the Eastern Himalayas known?

Ans : COMP 2019

The Himalayan mountains were formed from sediments deposited on the seabed. This mountain system spans a width of 160 to 320 km and stretches 2,400 km along India's northern and eastern borders. It includes the Karakoram Range, as well as the central and eastern Himalayas. Ancient geological forces shaped the Himalayas when the Indian Plate collided with the Eurasian landmass, causing the northernmost boundary of India to rise continuously. The eastern offshoots of the Himalayas are called the Purvanchal Hills.

39. State how the Northern Plains were formed?

Ans : COMP 2021

The Northern Plains were formed by the deposition of sediments carried by the Indus, Ganga and Brahmaputra river systems and their tributaries. Over millions of years, these rivers deposited eroded material from the Himalayas into the basin at the foothills. This process created a fertile alluvial plain with flat terrain and rich soil, making it highly suitable for agriculture..

40. Give two difference between the Plains of North India and the Coastal Plains.

Ans : MAIN 2012

Feature	**Plains of North India**	**Coastal Plains**
Formation	Formed by river deposits (Indus, Ganga,)	Formed by coastal and marine processes.

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Location	Inland with flat alluvial soil.	Along the coast with deltas and lagoons.

41. Name two rivers of the Peninsular Plateau that flow towards the Arabian Sea. Name two rivers that flow into the Bay of Bengal.

Ans : MAIN 2008

Two major rivers of the Peninsular Plateau that flow towards the Arabian Sea are the Narmada and the Tapi, both of which originate from central India and flow westward. On the other hand, two important rivers that flow into the Bay of Bengal are the Godavari and the Krishna, which originate in the Western Ghats and traverse eastward, forming extensive deltas before merging with the Bay of Bengal.

42. (i) Name the four parts of the Peninsular Plateau of India.
(ii) Name the landforms that form the boundaries of the Peninsular Plateau.

Ans : SQP 2017

(i) The four parts of the Peninsular Plateau of India are:
1. The Eastern Plateau
2. The Central Plateau
3. The Deccan Plateau
4. The Kathiawar and Kutch Region

(ii) The landforms forming the boundaries of the Peninsular Plateau are:
1. The Eastern Ghats
2. The Western Ghats
3. The Vindhya Range
4. The Satpura Range
5. The Aravalli Mountains

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43. Give two differences between Eastern Ghats and Western Ghats.

Ans : COMP 2022

Feature	Western Ghats	Eastern Ghats
Location	Parallel to the west coast.	Parallel to the east coast.
Height	Average height is 1200 m; lofty mountains.	Average height is 450 m; low hills.
Continuity	Continuous chain of mountains.	Broken chain, dissected by rivers.

NODIA

44. Name the source of the river Ganga. Where does this river enter the plains ?

Ans : MAIN 2021

The river Ganga originates from the Gangotri Glacier in Uttarakhand, where it is called the Bhagirathi. The river enters the plain from North Western part of Uttar Pradesh and Uttaranchal above that is Shivalik hills.

45. (i) Name any two left bank tributaries of the Ganga.
(ii) Is Ganga a perennial river? Give reason.

Ans : MAIN 2005

(i) Two left-bank tributaries of the Ganga:
1. Ghaghara
2. Gomti

(ii) Yes, the Ganga is a perennial river because it is fed by both glacial meltwater from the Himalayas and rainwater. The Gangotri Glacier ensures a continuous flow throughout the year, even during dry seasons.

46. Give two differences between rivers of Northern India and the rivers of Southern (Peninsular) India.

Ans : SQP 2001

Feature	Rivers of Northern India	Rivers of Southern (Peninsular) India
Source	Originate from the Himalayas or glaciers.	Originate from the Peninsular Plateau or Western Ghats.

Nature and Flow	Perennial, fed by both glaciers and rainfall.	Non-perennial, mainly dependent on rainfall.

47. Name the only significant river of the Rajasthan Plains? Name the largest river island in the world ?

Ans : COMP 2017

The only significant river of the Rajasthan Plains is the Luni River. The largest river island in the world is Majuli, located on the Brahmaputra River in Assam, India.

48. (i) How is cultivation carried out in Rajasthan Plains ?
(ii) Name the fertile tracts of these plains.

Ans : MAIN 2020

(i) Cultivation is done in small patches, often relying on water from small streams originating in the Aravalli Hills during the rainy season. Additionally, irrigation from wells and canals supplements water for agriculture in this arid region.
(ii) These fertile tracts are known as Rohi.

49. By what name are the Western Ghats known as at :
(i) Tamil Nadu
(ii) Kerala
(iii) Maharashtra.

Ans : SQP 2023

(i) Tamil Nadu : The Western Ghats are known as the Nilgiri Hills.
(ii) Kerala : They are called the Annamalai Hills and Cardamom Hills.
(iii) Maharashtra : In this region, the Western Ghats are also referred to as the Sahyadri Hills.

50. Name two rivers of the Peninsular Plateau that flow along (i) Eastwards (ii) Westwards

Ans : MAIN 2018

(i) Eastward-flowing rivers of the Peninsular Plateau:
1. Godavari
2. Krishna

(ii) Westward-flowing rivers of the Peninsular Plateau:
1. Narmada
2. Tapi

51. Name :
(i) The longest river in India.
(ii) The longest river of the Deccan Plateau.
(iii) A braided river.
(iv) A river of the Peninsular Plateau that does not form a delta.
(v) The highest peak of the Western Ghats.
(vi) The highest peak of the Eastern Ghats.

Ans : SQP 2022

(i) Ganga
(ii) Godavari
(iii) Brahmaputra
(iv) Narmada
(v) Anamudi
(vi) Jindhagada Peak.

THREE MARKS QUESTIONS

52. Give a geographical reason for each of the following :
(i) The rivers of South India are less suitable for irrigation than the rivers of north India.
(ii) The Peninsular Plateau of India is considered to be a part of Gondwanaland hundreds of million years ago.
(iii) The Narmada and Tapi do not form deltas.

Ans : MAIN 2018

(i) The rivers of South India flow through hard, rocky terrain and have steeper gradients, which result in faster-flowing water. This makes them less suitable for irrigation compared to the rivers of North India, which flow over flat alluvial plains and have a gentler slope, making canal irrigation easier.
(ii) The Peninsular Plateau is one of the oldest landmasses on Earth, characterized by stable geological formations. Its ancient

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rocks and mineral-rich structure match those of other regions that were part of Gondwanaland, such as Africa, South America and Australia, supporting the theory of continental drift.

(iii) The Narmada and Tapi rivers flow through narrow, rocky valleys and empty directly into the Arabian Sea. Their steep gradients and lack of extensive deposition areas prevent the formation of deltas. Instead, they form estuaries at their mouths.

53. Give a geographical reason for each of the following :

(i) Most of the rivers in South India flow into the Bay of Bengal.

(ii) The Rann of Kutch is not cultivated.

(iii) The Rajasthan Plains are an area of inland drainage.

Ans : SQP 2020

(i) Most rivers in South India originate in the Western Ghats. Since the slope of the Western Ghats inclines from west to east, these rivers flow eastward and drain into the Bay of Bengal.

(ii) The Rann of Kutch is not cultivated because:

1. It lacks fertile soil.
2. The area is below sea level and gets inundated during high tides.

(iii) An area of inland drainage exists north of the Luni basin because the rivers in this region lack sufficient water to reach the sea. Instead, they dry up or vanish into the sand. These plains are characterized by several salt lakes along the eastern edge of the desert, including Sambhar, Kuchaman and Didwana.

54. Give a geographical reason for each of the following :

(i) Less land is available for agriculture on the West coast than on the East coast.

(ii) Access through the Western Ghats is difficult.

(iii) The Peninsular Plateau of India is rich in mineral resources.

Ans : COMP 2013

(i) On the western coast, there are fewer rivers compared to the eastern coast. Notably, the Narmada and Tapi are the only major rivers flowing into the Arabian Sea and they do not form deltas at their mouths. In contrast, the eastern coast has several rivers, such as the Godavari, Krishna, Kaveri and Mahanadi, which form extensive deltas and contribute significantly to alluvial deposits where they meet the Bay of Bengal. Consequently, the western coast, bordered by the steep Western Ghats, has a narrow strip of coastal land. Meanwhile, the eastern coast, flanked by the discontinuous and lower Eastern Ghats, features wider alluvial plains formed by the rivers.

(ii) Access through the Western Ghats is difficult because the hills rise steeply from the coastal plains, creating a rugged and challenging terrain.

(iii) The Peninsular Plateau of India is rich in mineral resources because it consists of hard, crystalline igneous rocks, which are rich in minerals like iron ore, manganese and bauxite.

55. Give a reason for each of the following :

(i) Patna gets a heavier rainfall than Varanasi.

(ii) The Arabian Sea branch of the South West Monsoon does not shed any moisture in Western Rajasthan.

(iii) India has varied climatic conditions.

Ans : MAIN 2003

(i) Patna is located further east compared to Varanasi and is closer to the center of the Bay of Bengal branch of the Southwest Monsoon. As a result, it receives more rainfall due to higher moisture content in the air.

(ii) Western Rajasthan lies in the rain shadow region of the Aravalli Hills. The Aravallis run parallel to the direction of the monsoon winds, preventing them from rising and causing rainfall.

NODIA

(iii) India's vast geographical area, diverse topography (including mountains, plateaus and plains) and its location in the tropical and subtropical zones result in varied climatic conditions. Factors like the Himalayas, monsoon winds and proximity to oceans further contribute to this diversity.

56. Give a geographical reason for each of the following :

(i) The Northern Plains of India are one of the most densely populated regions of the world.

(ii) The Deccan Plateau is an example of a dissected plateau.

(iii) The rivers of South India are easier to tap for power than the rivers of north India.

Ans : MAIN 2019

(i) The Northern Plains of India are highly fertile and have abundant water resources, making them ideal for agriculture. This is why they are among the most densely populated regions in the world.

(ii) The Deccan Plateau is characterized by uneven terrain formed by extensive erosion over millions of years. Rivers and streams have carved valleys and ridges, creating a dissected landscape with steep slopes and flat-topped hills.

(iii) The rivers of South India are easier to harness for power because:

(a) They have smaller basins and catchment areas.

(b) The peninsular rivers flow through relatively shallow regions.

57. How do the northern plains contribute to the economic growth of India ?

Ans : SQP 2014

The Northern Plains, the largest riverine plain in the world, play a vital role in India's economic growth in the following ways:

(i) The region is a major food producer, cultivating a variety of crops such as wheat, maize, rice, sugarcane, pulses, oilseeds, jowar and bajra. Jute is a significant cash crop for export.

(ii) The lower and upper Gangetic plains are known for producing important crops like rice, jute, sugarcane and wheat.

(iii) Numerous agro-based industries have developed in the fertile Ganga plains, utilizing the agricultural surplus.

(iv) A well-connected network of roads and railways supports trade, transport and overall economic growth.

(v) The region's rivers have facilitated the construction of multi-purpose projects that provide irrigation during dry seasons, control floods during monsoons and generate electricity, all contributing to economic stability.

(vi) Ports like Kolkata and Haldia enhance trade and commerce, promoting economic growth.

(vii) The presence of religious centers attracts a significant number of tourists, generating foreign exchange and supporting the local economy.

MAP BASED QUESTION

58. On an outline map of India shade and mark the following:

Mountains and Plateaus : Himalayas, Karakoram Range, Aravali Range, Vindhyas, Western and Eastern Ghats, Deccan Plateau, Satpura Range, Garo, Khasi, Jaintia Hills, Chota Nagpur Plateau and Malwa Plateau.

Passes : Karakoram, Nathu La.

Plains : Gangetic Plains, Coastal Plains.

Rivers : Indus, Ravi, Beas, Chenab, Jhelum, Sutlej, Ganga, Yamuna, Ghaghra, Gomti, Gandak, Kosi, Chambal, Betwa, Son, Damodar, Brahmaputra, Tapti, Mahanadi, Narmada, Godavari, Krishna, Kaveri and Tunghbhadra.

Water Bodies : Gulf of Kutch, Gulf of Khambhat, Gulf of Mannar, Palk Strait, Andaman Sea, Chilka Lake, Wular Lake.

Cities : Delhi, Mumbai, Kolkata, Chennai, Hyderabad, Bengaluru, Kochi, Chandigarh, Srinagar, Visakhapatnam, Prayagraj

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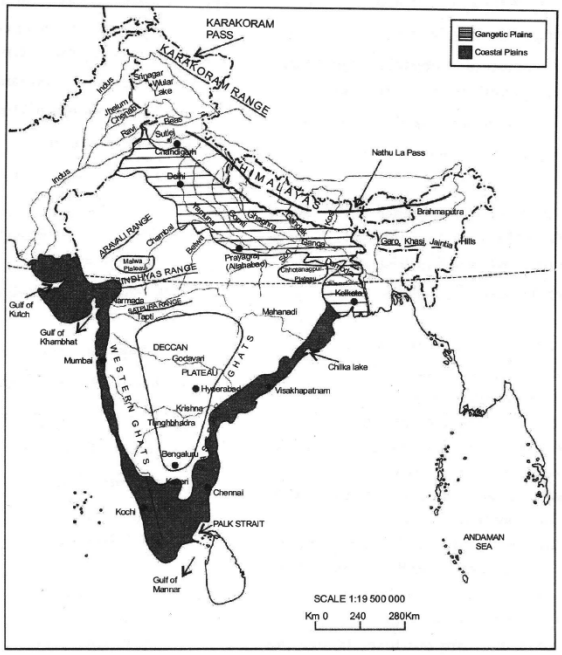
(Allahabad).

Ans : MAIN 2023



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CHAPTER 4

CLIMATE

SUMMARY

1. CLIMATE

Climate refers to the long-term atmospheric conditions over a large area, including temperature, humidity, wind, and precipitation patterns. India experiences a tropical monsoon climate. The Tropic of Cancer divides the country into subtropical (north) and tropical (south) zones, but the monsoon influences the entire region, making India a tropical country.

1.1 Factors Affecting the Climate of India

The climate of India is influenced by several factors :

(i) **Latitude :** The Tropic of Cancer divides India into tropical (south) and subtropical (north) zones, giving the country both climate characteristics.

(ii) **Western Disturbances :** Originating from the Mediterranean, these bring light rain to Northern India and sustain Himalayan river flow through summer snowmelt.

(iii) **Altitude :** Higher altitudes result in cooler temperatures, as seen in Agra and Darjeeling, despite being on the same latitude.

(iv) **Himalayan Mountains :** These mountains block cold northern winds, protecting India from harsh winters and trapping monsoon winds, causing rainfall.

5. **Distance from the Sea :** Southern India's proximity to the sea moderates its climate, while northern regions have more extreme conditions.

6. **Pressure and Winds :** North-easterly winds and Westerly jet streams influence the weather, bringing disturbances to northern parts of India.

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1.2 Continental and Equable Type of Climate

(i) North and Central India, being far from the sea, experience a continental climate with extreme temperatures - hot summers and cold winters. In contrast, coastal areas enjoy a maritime climate, where temperature variations between summer and winter are minimal.

(ii) **Tropical Cyclones :** These cyclones form in the Bay of Bengal and Arabian Sea during summer and move inland, increasing rainfall in affected areas.

(iii) **Relief Features :** Landforms like mountains and plateaus impact rainfall. The Aravalli hills don't block rain-bearing winds, making Western Rajasthan dry, while the windward side of the Western Ghats receives heavy rainfall as these mountains trap moisture-laden winds.

2. DISTRIBUTION OF TEMPERATURE AND RAINFALL

While India has a unified climatic pattern, there are significant regional differences in temperature and rainfall.

2.1 Temperature Distribution

In winter, temperatures in the northwest mountains can drop to -45°C, while in Thiruvananthapuram, Kerala, it remains around 22°C. During summer, parts of Western Rajasthan can reach 50°C, whereas Shillong stays at around 20°C. Regions south of the Tropic of Cancer, such as Bengaluru, Mumbai, and Chennai, maintain a moderate 25-27°C year-round due to the sea's influence. In areas like the Thar Desert, daytime

temperatures can hit 50°C, dropping to 15°C at night. In contrast, coastal areas like Kerala and the Andaman and Nicobar Islands have minimal day-night temperature differences.

3. RAINFALL DISTRIBUTION

Rainfall in India varies greatly:

1. Heavy Rainfall (200+ cm): The Western coast, sub-Himalayan regions, and Meghalaya's Garo, Khasi, and Jaintia hills receive the most rainfall.
2. Moderate Rainfall (100-200 cm): Areas include parts of the Western Ghats, North-East India, West Bengal, Odisha, Bihar, and Uttarakhand.
3. Inadequate Rainfall (Less than 50 cm): Western Rajasthan, Gujarat, Karnataka Plateau, Tamil Nadu, and Ladakh experience very low rainfall, often less than 20 cm.

4. WINDS IN SUMMER AND WINTER

Jet Streams (Summer and Winter) : These are narrow belts of high-altitude westerly winds in the troposphere, crucial for monsoon arrival. Their speed ranges from 110 km/h in summer to 184 km/h in winter.

1. **Loo (Summer) :** A hot, dry wind that blows during May and June in northern and north-western India, causing high temperatures and low air pressure.
2. **South-West Summer Monsoon Winds (Summer) :** Blowing from June to September, these winds bring moisture and rain from the southwest to the northeast across India.
3. **North-East Monsoon Winds (Winter) :** These dry winds blow from land to the ocean during winter. However, those passing over the Bay of Bengal bring rain to the east coast.
4. **Mango Showers (Summer) :** Local rains in South India during April-May help ripen mangoes and aid coffee and cherry crops.
5. **Kaal Baisakhi (Summer) :** Thunderstorms with rain in April-May in West Bengal, beneficial for tea, rice, and jute crops. Known as "Norwester" due to its direction.
6. **Monsoon and Its Mechanism :** The monsoon is the most prominent feature of the Indian climate. It is primarily driven by the differential heating and cooling of land and sea. During the summer months, the land heats up more rapidly than the ocean, creating low-pressure areas over the land and high-pressure areas over the sea. This difference in pressure causes moist winds to blow from the ocean toward the land, bringing the southwest monsoon rains.
7. The arrival of the monsoon is a much-anticipated event across India, as it brings relief from the intense summer heat and provides essential rainfall for agriculture. The monsoon season usually starts in June and lasts until September. The western coast and northeastern regions receive the highest rainfall during this time, while the northwestern regions are relatively dry. The retreating monsoon refers to the period when the monsoon winds start withdrawing from the northern parts of the country in October and November. The retreat of the monsoon leads to a reduction in rainfall, and dry conditions set in over most parts of the country. However, during this period, the southeastern coast, particularly Tamil Nadu, receives rainfall due to the northeast monsoon.

5. SEASONS IN INDIA:

India experiences four main seasons, each with distinct climatic conditions:

5.1 March to May – Summer:

During the summer season, temperatures rise significantly, particularly in the northern and central parts of the country. This is the hottest season in India, with temperatures often exceeding 40°C in many regions. Dry conditions prevail, except in coastal regions where humidity remains high due to the proximity to the sea. The northern plains and desert areas, like Rajasthan, experience extreme heat, while hill stations like Shimla

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and Darjeeling offer respite from the hot weather.

5.2 June to September – Monsoon:

The southwest monsoon arrives in June, bringing widespread rainfall across India. The monsoon is crucial for the country's agriculture, as it provides the majority of the annual rainfall. Regions along the Western Ghats and northeastern states receive the heaviest rainfall, while interior areas experience moderate to heavy showers. During this season, temperatures decrease due to cloud cover and rainfall, but humidity levels remain high. October to November – Retreating Monsoon:
As the southwest monsoon withdraws from northern and central India, the retreating monsoon or post-monsoon season begins. Rainfall reduces in most parts of the country, although the southeastern coast, particularly Tamil Nadu, receives rain from the northeast monsoon. This period is characterized by clear skies, declining temperatures, and dry weather in most areas, except for occasional showers in coastal regions.

5.3 December to February – Winter:

Winter is the coldest season in India, especially in the northern parts of the country. Temperatures drop significantly, particularly in the northern plains and Himalayan regions, where snowfall occurs. The southern part of India, however, experiences relatively mild winter conditions due to its proximity to the equator. During this season, cold winds from the Himalayas affect the northern plains, leading to cold waves and frost in certain areas.

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MULTIPLE CHOICE QUESTION

1. What causes snowfall in Kashmir during winter?
(a) Tropical cyclone
(b) Northeast Monsoon wind
(c) Southwest Monsoon wind
(d) Temperate cyclone

Ans : MAIN 2024

Thus (d) is correct option.

2. Which of the following area receives rain from the North East Monsoon?
(a) Konkan coast
(b) Ganga basin
(c) Coromandel coast
(d) Malabar coast

Ans : MAIN 2023

Thus (c) is correct option.

3. Western disturbances become active in northern India during which season?
(a) Summer
(b) Winter
(c) Spring
(d) Monsoon

Ans : SQP 2016

Thus (b) is correct option.

4. Why is the central part of Deccan plateau a dry area?
(a) It is away from the sea.
(b) There is no barrier in the path of rain bearing wind.
(c) It is due to Jet Streams.
(d) It is a rain shadow area of Western Ghats.

Ans : MAIN 2021

Thus (d) is correct option.

5. The northern half of India lies in:
(a) Torrid Zone
(b) Frigid Zone
(c) Temperate Zone
(d) Equatorial Zone

Ans : SQP2023

Thus (c) is correct option.

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6. What causes the winter rain along the Coromandel Coast?
(a) Sea breeze
(b) Retreating monsoon
(c) South-west monsoon
(d) Western disturbances

Ans : SQP 2015

Thus (d) is correct option.

7. Which of the statements is not correct for Indian monsoon?
(a) It is erratic is nature.
(b) It is seasonal in nature.
(c) Most of the rain is in winter time
(d) Most of the rain is orographic or relief type

Ans :

Thus (c) is correct option.

8. The summer monsoon winds blow in which direction?
(a) North-East
(b) South-West
(c) North-West
(d) South-East

Ans : COMP 2011

Thus (d) is correct option.

9. India experiences which type of climate?
(a) Temperature climate
(b) Tropical Monsoon climate
(c) Temperature Continental Climate
(d) Mediterranean Climate

Ans : MAIN 2001

Thus (b) is correct option.

10. The Deccan Plateau gets less rainfall than the Western Ghats because
(a) it lies in the way of South West Monsoon winds.
(b) it lies in the rain shadow area of the Himalayas
(c) it lies in the rain shadow area of the Western Ghats.
(d) it is triangular in shape.

Ans : MAIN 2002

Thus (c) is correct option.

11. Which of the following is NOT a source of rainfall for Punjab and Haryana?
(a) Western disturbances
(b) Arabian Sea branch of South-west monsoon
(c) Bay of Bengal branch of South-west monsoon
(d) Retreating monsoon.

Ans : COMP 2024

Thus (c) is correct option.

12. Which of the following factors does not affect the climate of a place?
(a) Vasried relief
(b) The Monsoon Winds
(c) Distance from the Sea
(d) Presence of vegetation.

Ans : MAIN 2000

Thus (d) is correct option.

13. Which of the following is good for the cultivation of tea and jute?
(a) Mango showers
(b) Loo
(c) Kalbaisakhi
(d) None of the above

Ans : SQP 2019

Thus (a) is correct option.

14. Where does the Arabian Sea Branch join the Bay of Bengal branch?
(a) In Punjab and Haryana
(b) In Western Ghats
(c) In Chota Nagpur Plateau
(d) In the Sahyadris.

Ans : MAIN 2010

Thus (c) is correct option.

15. What causes the 'October Heat'?
(a) High temperature and heavy rainfall.
(b) Reduced temperature and heavy rainfall.
(c) High temperature and humidity.
(d) Reduced temperature and humidity.

Ans : COMP 2022

Thus (c) is correct option.

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16. Which state in India is the first to experience the onset of the monsoon and the last to see its withdrawal?
(a) Tamil Nadu
(b) Kerala
(c) West Bengal
(d) Andaman and Nicobar

Ans : MAIN 2004

Thus (b) is correct option.

17. Why does Patna get more rain than Agra during the summer monsoon season ?
(a) Patna lies on windward side.
(b) Patna is on western side, so Arabian Sea branch brings more rain to it than to Agra.
(c) Patna is on eastern side, so Bay of Bengal branch brings more rain to it than to Agra.
(d) Patna gets rain throughout the year.

Ans : MAIN 2022

Thus (c) is correct option.

18. Why do the interior parts of the Deccan remain dry during the Retreating monsoon?
(a) Because they lie in the rainshadow of the Eastern Ghats.
(b) Because they lie parallel to the Eastern Ghats.
(c) Because they lie in the rainshadow of the Western Ghats.
(d) Because they lie parallel to the Arabian Sea Branch.

Ans : SQP 2013

Thus (c) is correct option.

19. Mumbai has a maritime climate but Kanpur has:
(a) Mediterranean
(b) Continental climate
(c) Moderate climate
(d) Tundra climate

Ans : COMP 2016

Thus (b) is correct option.

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20. Climate of India is strongly influenced by
(a) Trade winds
(b) Loo
(c) Easterly winds
(d) Monsoon winds

Ans : SQP 2006

Thus (d) is correct option.

21. Which of the following factors cause the rise in the temperature of mainland of India in the month of March?
(a) The land breeze blows towards the sea
(b) The pressure belts shift.
(c) Southward migration of the sun from the equator.
(d) Northward migration of the son from the equator.

Ans : COMP 2018

Thus (d) is correct option.

22. Which of the following areas get rainfall from the Retreating monsoon?
(a) West Coast of India
(b) East Coast of India
(c) Western Ghats
(d) Thar desert

Ans : COMP 2017

Thus (b) is correct option.

23. From which of the following waterbodies do the south-west monsoon pick up moisture?
I. Bay of Bengal
II. Andaman Sea
III. Arabian Sea
IV. Indian Ocean
(a) I and II
(b) I and III
(c) III and IV
(d) II and III

Ans : COMP 2008

Thus (a) is correct option.

24. The tropical cyclones are common in:
(a) Arabian Sea
(b) Gulf of Khambat
(c) Indian Ocean
(d) Bay of Bengal

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Ans : MAIN 2020

Thus (d) is correct option.

25. _____mountain range affects the climate of India immensely.
(a) Vindhyan
(b) Himalayan
(c) Sulaiman
(d) North eastern

Ans : SQP 2018

Thus (b) is correct option.

26. The temperate cyclones originate from:
(a) Black sea
(b) Baltic sea
(c) Persian gulf
(d) Mediterranean sea

Ans : MAIN 2014

Thus (d) is correct option.

27. The air current which blow in the upper atmosphere and help western disturbances enter India is:
(a) South-West Monsoon current
(b) Tropical cyclones
(c) Jet Streams
(d) North-East Monsoon current

Ans : MAIN 2000

Thus (c) is correct option.

28. In the cold season, rain is caused in the coastal region of Tamil Nadu by:
(a) South-West monsoon
(b) South-East monsoon
(c) North-West monsoon
(d) North-East monsoon

Ans : SQP 2007

Thus (d) is correct option.

29. The cold season is from:
(a) Mid-November to January
(b) Mid-October to December
(c) Mid-November to February
(d) Mid-December to February

Ans : COMP 2019

Thus (c) is correct option.

30. A wind always blows from_____pressure.
(a) High to low
(b) Low to high
(c) Only high
(d) Only low

Ans : COMP 2017

Thus (a) is correct option.

31. The arrival of the monsoon is known as:
(a) Rainy season
(b) Retreating of the monsoon
(c) Bursting of the monsoon
(d) Break in the monsoon

Ans : COMP 2010

Thus (c) is correct option.

32. Rajasthan lies in the rainshadow region of:
(a) Shiwalik Range
(b) Kirthar Range
(c) Nilgiri Hills
(d) Aravalli Hills

Ans : SQP 2011

Thus (d) is correct option.

33. The winds blowing in south India which help in the growth of coffee and tea are:
(a) Loo
(b) Temperate cyclones
(c) Kalbaisakhi
(d) Mango showers

Ans : SQP 2004

Thus (d) is correct option.

34. In India, there are_____seasons.
(a) Four
(b) Three
(c) Two
(d) Five

Ans : MAIN 2016

Thus (a) is correct option.

35. The temperature increases from_____to north in the hot season in India.
(a) East
(b) West
(c) South
(d) South-east

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Ans : SQP 2005

Thus (c) is correct option.

36. Rain in Punjab in winter is caused by:
(a) Tropical cyclone
(b) Temperate cyclone
(c) Trade winds
(d) Monsoons

Ans : MAIN 2001

Thus (b) is correct option.

37. Relief means the same as:
(a) Plateau
(b) Valleys
(c) Orographic
(d) Rivers

Ans : MAIN 2005

Thus (c) is correct option.

38. The distribution of rainfall depends on:
(a) Relief of the land
(b) Direction of moisture-laden winds
(c) Path of cyclonic depression
(d) All of these

Ans : MAIN 2002

Thus (d) is correct option.

39. The Kalbaisakhi is a:
(a) Seasonal wind
(b) Local wind
(c) Permanent wind
(d) Cyclone wind

Ans : SQP 2018

Thus (d) is correct option.

ONE MARK QUESTIONS

40. What type of wind is 'Monsoon' ? What is its direction during summer ?

Ans : SQP 2019

Periodic wind, South - West

41. 'India has varied climatic conditions'. Give reason.

Ans : COMP 2008

Because of its vastness and varied physiographicdivisions.

42. The Northern Plains of India have a Continental type of Climate. Give reason.

Ans : MAIN 2013

Because northern plains are located away from the influence of sea.

43. What is the name given to the climate of India ?

Ans : SQP 2016

Monsoon climate.

41. Mention the different sources of rain in Punjab and Tamil Nadu during the winter season.

Ans : COMP 2014

Temperate cyclone and North-east trade winds.

45. Name the winds that bring heavy rain to Cherrapunji ?

Ans : SQP 2016

South-West monsoon.

46. Name any two states with annual rainfall of less than 50 cm.

Ans : MAIN 2023

Rajasthan and Gujarat.

47. Name a state that is first to experience the onset of the monsoon.

Ans : MAIN 2018

Kerala

48. Name two places of extreme climate in India.

Ans : COMP 2013

Rajasthan and Punjab.

49. Name the months in which Retreating Monsoon rain is experienced.

Ans : MAIN 2020

The months are October and November.

NODIA

50. Name three months with low temperature.

Ans : SQP 2016

December, January and February.

51. Name any two states that receive rain in January-February from North-East Monsoons.

Ans : SQP 2011

Jammu and Kashmir and partially Punjab receive rain in January-February.

52. What is monsoon ?

Ans : COMP 2024

Monsoon is a periodic wind which changes its direction with change in season.

53. Name the state which experiences the longest monsoon season and another state which has the shortest monsoon season.

Ans : SQP 2019

Kerala experiences the longest monsoon season. Jammu & Kashmir experiences the shortest monsoon season.

54. Name two coldest areas in India.

Ans : COMP 2015

Dras and Kargil. (Temp. — 40°C)

55. What are cherry blossoms ?

Ans : COMP 2017

Thunderstorms developed in hot weather season cause some rainfall in Karnataka. These rains are known as cherry blossoms. These are quite useful for coffee plantation.

56. What is a jet stream ?

Ans : MAIN 2015

A jet stream is fast wind in a narrow zone in the upper atmosphere.

57. What is meant by 'Kal Baisakhi' ?

Ans : SQP 2004

These are thunderstorms, accompanied with strong winds and heavy rainfall. In local language it is also known as 'the calamity in the month of baisakh'.

58. Name two states where 'Mango showers' are common.

Ans : SQP 2013

Kerala and Karnataka

59. Name two states on the eastern coast which are frequently struck by tropical cyclones.

Ans : COMP 2016

Andhra Pradesh and Tamil Nadu.

60. What is meant by 'breaking of monsoon' ?

Ans : MAIN 2002

The rain bearing monsoons are extremely strong and violent. Their approach is accompanied by thunder and lightening. This is known as breaking of monsoon.

61. Why does the Monsoon wind change its direction ?

Ans : MAIN 2021

Monsoon wind changes its direction due to variation in temperature and pressure over the sea and land.

62. Name two months associated with retreating monsoons.

Ans : MAIN 2021

October and November.

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63. Name some regions for which the tropical cyclones are very destructive.

Ans : SQP 2002

Deltas of Godavari, Krishna and Kaveri.

64. Name two regions of India which receive over 200 ems of annual rainfall.

Ans : COMP 2000

(i) Meghalaya – North East region.
(ii) Western ghats, Nagaland – North East region.

65. Name two factors which play an important role in the mechanism of the monsoons.

Ans : COMP 2018

(i) Surface winds
(ii) Variation in temperature.

66. Name two stations most influenced by Bay of Bengal branch of South-West monsoons.

Ans : SQP 2005

Shillong and Kolkata.

67. Name two stations most influenced by the Arabian Sea Branch of South-West Monsoons.

Ans : SQP 2009

Mumbai and Thiruvananthapuram.

68. What is loo ?

Ans : MAIN 2007

It is a local wind which is hot and dry.

69. Name any two driest stations of India.

Ans : SQP 2024

Leh and Jodhpur.

70. What type of winds prevail during the cold weather over the country ?

Ans : MAIN 2000

North-east trade winds.

71. Name two stations receiving winter showers from the western disturbances.

Ans : COMP 2013

Amritsar and Delhi.

72. Name three states where dust storms are very common during May.

Ans : SQP 2003

Punjab, Haryana and eastern Rajasthan.

73. Name three most rainy months of India as a whole.

Ans : MAIN 2021

June, July and August.

74. Name the months which are associated with advancing monsoons.

Ans : COMP 2019

June to September.

75. Name the hill which deflects the Bay of Bengal branch of advancing monsoons to India.

Ans : MAIN 2004

The Arakan hills (Myanmar).

76. How is average rainfall calculated ?

Ans : MAIN 2024

$$\text{Average rainfall} = \frac{\text{Total annual rainfall}}{\text{Number of months}}$$

77. Name any two stations having equable climate.

Ans : COMP 2021

Mumbai and Chennai.

78. What is cold wave ?

Ans : MAIN 2006

The wind which blows when the temperature falls below 5°C.

79. Name two stations with most extreme climate.

Ans : MAIN 2018

Leh and Jodhpur.

80. Name and give the direction of winds that causes snow and rainfall in the northern parts of India during winter season.

Ans : SQP 2014

Temperate cyclones from west to east.

81. Name two stations influenced by North-East Monsoons.

Ans : COMP 2017

Chennai and Bengaluru.

82. Write any two parts of India which receive very low rainfall.

Ans : SQP 2022

Rajasthan and some parts of Gujarat.

83. Write any one effect of jet streams.

Ans : COMP 2003

They play an important role in the formation of cyclones and anticyclones.

84. State any two factors which govern Indian climate.

Ans : MAIN 2005

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(i) Location
(ii) Relief
(iii) Surface winds
(iv) Upper air circulation.

85. Name the type of climate prevailing over India.

Ans : SQP 2016

Tropical monsoon.

TWO MARKS QUESTIONS

86. Himalayas act as a climatic divide.' Justify the statement giving two reasons.

Ans : MAIN 2024

'Himalayas act as a climatic divide due to following reasons :

(i) **Barrier to Cold Winds :** They block cold winds from Central Asia, keeping northern India warmer in winter.
(ii) **Monsoon Impact :** The Himalayas force the southwest monsoon winds to drop rainfall on the northern plains, while creating drier conditions on the leeward side.

87. Differentiate between Southwest Monsoon and Retreating Monsoon. (Any two differences)

Ans : MAIN 2024

Difference between Southwest Monsoon and Retreating Monsoon :

Feature	**Southwest Monsoon**	**Retreating Monsoon**
Season	June to September	October to November
Wind Direction	Blows from the southwest towards India	Blows from the northeast, away from India
Rainfall	Brings heavy rainfall	Leads to gradual decrease in rainfall

88. Name the seasons of India and mention the duration of each season.

Ans : MAIN 2023

India has four main seasons:
(i) **Winter :** December to February
(ii) **Summer :** March to May
(iii) **Monsoon :** June to September
(iv) **Post-Monsoon (Autumn) :** October to November

89. Why maximum rainfall in India occurs after the summer season?

Ans : MAIN 2023

Maximum rainfall in India occurs after the summer season due to the southwest monsoon winds. These winds are driven by the temperature difference between the Indian Ocean and the heated landmass of India. The moist air from the ocean is pulled inland, causing heavy rainfall during the monsoon season, particularly from June to September.

90. Give two reasons why Jaipur has a higher annual range of temperature than Mumbai ?

Ans : COMP 1999,2009

(i) Jaipur is located inland, away from the sea, so it experiences greater temperature fluctuations, while Mumbai's coastal location moderates its temperatures.
(ii) Jaipur has a desert-like climate with hot summers and cold winters, whereas Mumbai has a tropical coastal climate with relatively stable temperatures throughout the year.

91. (i) Name any two states/Union Territories that receive rain in January-February.
(ii) What causes this rain ?

Ans : SQP 1995,2000

(i) Punjab and Jammu & Kashmir.
(ii) Temperate Cyclone.

92. Why is the diurnal range of temperature during summer greater at Bikaner (Rajasthan) than at Panjim (Goa) ?

Ans : SQP 1994

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The diurnal range of temperature during summer is greater at Bikaner because it is located in the desert, where low humidity and clear skies cause extreme temperature differences between day and night. In contrast, Panjim's coastal location and high humidity moderate temperature fluctuations, resulting in a smaller diurnal range.

93. Give two reasons why the entire Indian subcontinent has the tropical monsoon climate.

Ans : COMP 2012

(i) Himalayas' Influence on Climate: The Himalayas significantly impact the subcontinent's climate by blocking cold winds from northern Asia, preventing them from reaching India.
(ii) Monsoon Winds and Tropical Climate: The Himalayas trap the monsoon winds, giving the region a tropical climate characteristic.

94. (i) Which winds are responsible for the rainfall experienced over the greater part of the Indian subcontinent ?
(ii) During which months of the year is this rainfall experienced ?

Ans : SQP 1999

(i) The Southwest Monsoon winds are responsible for the rainfall experienced over the greater part of the Indian subcontinent.
(ii) June, July.

95. Mention a geographical reason for each of the following :
(i) Patna receives heavier rain than Delhi.
(ii) Mangalore is not cold even in the month of December.

Ans : SQP 2014

(i) Patna receives heavier rain than Delhi because it is closer to the Bay of Bengal and lies in the direct path of the monsoon winds, leading to more rainfall.
(ii) Mangalore is not cold even in December because its coastal location near the Arabian Sea moderates the temperature, keeping it warm.

96. Name the four main seasons in India.

Ans : MAIN 2017

(i) Cold Weather Season (Winter) : December to February
(ii) Hot Weather Season (Summer) : March to May
(iii) Southwest Monsoon Season (Rainy season) : June to September
(iv) Season of Retreating Monsoon (Autumn) : October to November

97. Give any two important characteristics of the South West Monsoon rainfall.

Ans : MAIN 2013

(i) The amount of rainfall decreases as the monsoon winds progress westward.
(ii) The rainfall is inconsistent and often difficult to predict.

98. How does the 'Mango shower° influence the state of Karnataka ?

Ans : MAIN 2018

The 'Mango showers' in Karnataka help in early mango ripening, provide moisture for summer crops like paddy, and offer relief from the summer heat.

99. Name two types of cyclonic systems that affect India and two areas that receive rainfall from these systems.

Ans : SQP 2013

(i) Two types of cyclonic systems that affect India :
  (a) Tropical Cyclones (originating in the Bay of Bengal and the Arabian Sea)
  (b) Temperate Cyclones (also known as Western Disturbances)
(ii) Two areas that receive rainfall from these cyclonic systems :
  (a) Tamil Nadu (affected by tropical cyclones from the Bay of Bengal)
  (b) Punjab (receives winter rainfall due to temperate cyclones or western disturbances)

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100. State the agricultural benefits derived from Kalbaisakhi in Assam ?

Ans : COMP 2016

These local winds, accompanied by thunderstorms, bring rainfall during April-May. This rain is beneficial for the tea crop in Assam as well as for jute and rice cultivation in Bengal.

101. Give two reasons why the entire Indian subcontinent has the tropical monsoon climate.

Ans : COMP 2012

(i) The climate of the subcontinent is significantly influenced by the Himalayas, which block the cold winds from northern Asia from entering India.
(ii) The monsoon winds, which are trapped by the Himalayas, impart a tropical character to the subcontinent's climate.

102. (i) Mention two weather conditions which are associated with the "break" or "burst of monsoon".
(ii) Name two states which are affected by 'Kal Baisakhi'.

Ans : SQP 1998

(i) Violent thunder and lightening are associated with 'break' or 'burst' of monsoons.
(ii) Assam and Bengal are affected by ' Kal Baisakhi'.

103. Shillong gets less than 200 cm of rainfall in the year while Cherrapunji receives more than 1250 cm of rainfall". Give one reason.

Ans : MAIN 1998

Shillong receives less than 200 cm of rainfall because it is located on the leeward side of the Khasi Hills, which blocks the moisture-laden winds. In contrast, Cherrapunji is on the windward side, where these winds first hit, leading to heavy rainfall exceeding 1250 cm.

104. "India has diverse climatic conditions". Support this statement by giving two examples each of temperature and precipitation.

Ans : SQP 2015

India displays a wide range of climatic conditions, showing considerable differences in temperature and rainfall across various regions and seasons.
(i) In the western deserts, temperatures can soar to 55°C, while during winter, they may plummet to as low as -45°C around Leh.
(ii) Annual precipitation is below 10 cm in the northwestern Himalayas and the western desert, whereas it surpasses 400 cm in Meghalaya.

105. (i) What are Jet Streams ?
(ii) How do they influence the climate of the India ?

Ans : SQP 2018

(i) The jet stream is a fast-moving wind located at an altitude of 3 to 5 kilometers above the subtropical high-pressure belt and plays a crucial role in the monsoon mechanism.
(ii) Jet streams significantly impact India's climate. The westerly jet stream dominates the North Indian Plains during winter, while the easterly jet stream guides tropical depressions across India. These depressions are vital for determining the distribution pattern of monsoon rainfall in the subcontinent, with the highest rainfall occurring along their paths.

106. State the benefits that are derived from the local winds that blow in summer in the following states:
(i) Kerala
(ii) Bengal

Ans : MAIN 2014,2016

(i) **Mango Showers in Kerala :** Occurring in South India during April and May, these light rains are vital for mango, tea, and coffee plants.
(ii) **Kal Baisakhi in Bengal :** These local winds, accompanied by thunderstorms, bring rainfall during April and May, which is beneficial for jute and rice cultivation.

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107. "Define the following terms
1. Annual Range of Temperature.
2. Break or Burst of Monsoon.
3. Equable Climate.
4. Extreme Climate.
5. Jet Streams.
6. Kalbaisakhi
7. Loo
8. North-East Winter Monsoons
9. Rain Shadow Area
10. South-West Summer Monsoons.
11. Windward side.

Ans : MAI N 2000

1. The Annual Range of Temperature is the difference between the highest and lowest average temperatures recorded in a location over a year.
2. The abrupt arrival of moisture-laden winds, often accompanied by thunder, lightning, strong gusts, and intense rainfall.
3. Equable climate is characterized by minimal temperature fluctuations, leading to mild and consistent weather. Typically found in coastal areas, it is moderated by the ocean, preventing extreme heat or cold.
4. Extreme climate refers to weather conditions with significant temperature variations, leading to very high summer and very low winter temperatures. This climate is typically found in continental regions with minimal moderating influences.
5. Jet streams are fast-flowing air currents located in the upper atmosphere, typically found at altitudes of 8 to 15 kilometers. They influence weather patterns by affecting the movement of air masses and storm systems.
6. These thunderstorms are characterized by strong winds and heavy rainfall, occurring in Assam and West Bengal, and are beneficial for the growth of tea, coffee, and rice.
7. These hot, dry winds blow across the northern plains, including Uttar Pradesh, Bihar, and Punjab, during the months of May and June
8. These winds originate from the northern part of India and move towards the Arabian Sea. Although they are cold and dry, they can cause rainfall on the southeastern coast of India after collecting moisture from the Bay of Bengal.
9. A rain shadow area is a region that receives significantly less precipitation than its surroundings, typically found on the leeward side of a mountain range. As moist air rises over the mountains and cools, it loses moisture as rain on the windward side, leaving drier conditions on the leeward side.
10. The South-West Summer Monsoons are seasonal winds that bring heavy rainfall to the Indian subcontinent from June to September, originating from the Arabian Sea and crucial for agriculture.
11. The side of the mountain that faces moisture-laden winds and receives heavy rainfall, such as the western side of the Western Ghats facing the Arabian Sea and the windward slopes of the Garo and Khasi hills.

108. What is the direction of the summer monsoon? Why?

Ans : COMP 2006

The summer monsoon in India moves from the southwest to the northeast. This direction is due to the winds originating over the Arabian Sea and Indian Ocean, drawn by low-pressure areas created by the heating of land during summer, bringing moisture and heavy rainfall.

109. Name two types of cyclonic systems that affect India and two areas that receive rainfall from these systems.

Ans : MAIN 2013

Cyclone	Region
Temperate	Punjab
Tropical	Coastal areas of Odisha and Tamil Nadu

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110. State the climatic significance of the Himalayas to the people of India.

Ans : SQP 2004

The Himalayas play a crucial role in influencing India's climate. They block the rain-bearing Bay of Bengal branch of the southwest monsoons, which bring rainfall to the region. Additionally, the Himalayas prevent the cold northeast monsoon winds from entering India.

111. (i) Name the season during which the North East Trade Winds dominate the Indian subcontinent.
(ii) In which season do the above mentioned winds get completely reversed ? Name the four months covered by this season.

Ans : SQP 1997

(i) The North East Trade Winds dominate the Indian subcontinent during the winter season.
(ii) These winds get completely reversed during the summer (southwest monsoon) season, which covers the months of June, July, August, and September.

112. Why are Thiruvananthapuram and Shillong rainier in June than in July ?

Ans : MAIN 2005

Thiruvananthapuram and Shillong are rainier in June because the southwest monsoon is strongest when it first arrives. By July, the intensity of the monsoon reduces, leading to less rainfall.

113. Name the factors which affect the climate of a place.

Ans : SQP 2013

The climate of a country is primarily influenced by temperature, rainfall, atmospheric pressure, and wind direction. In the Indian subcontinent, two key factors significantly affect the climate:
(i) The Tropic of Cancer (2(iii)5° N), which divides the country into the North Temperate Zone and the South Tropical Zone.
(ii) The Great Himalayan Range, which separates the Indian subcontinent from the rest of Asia.

114. Mention two main features of the Indian Monsoon.

Ans : MAIN 2012

(i) Relief or Orographic Rainfall : Most rainfall results from moisture-laden winds being obstructed by mountain ranges, leading to heavy rain on the windward side and scant rainfall on the leeward side.
(ii) Erratic and Unpredictable Rainfall : Rainfall amounts can vary significantly, causing floods and droughts, with instances of early or delayed onset.

115. Name the type of climate prevailing over India. Mention any two factors responsible for it.

Ans : SQP 2010

The prevailing climate over India is the tropical monsoon climate.
(i) Monsoon Winds : The southwest monsoon brings heavy rainfall during the summer months.
(ii) Geographical Diversity : India's varied topography influences temperature and precipitation patterns.

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116. State two important characteristic features of the Monsoon rainfall in India.

Ans : COMP 2011

(i) Seasonality : It occurs primarily from June to September during the summer months.
(ii) Geographical Variation : Rainfall amounts vary greatly across regions, with the western coast and northeastern states receiving the most, while areas like Rajasthan get much less.

117. (i) What is 'Monsoon' ?
(ii) Name the place in India which receives the heaviest rainfall.

Ans : MAIN 2004

(i) Monsoon : A monsoon is a seasonal wind pattern that brings significant changes in weather, characterized by heavy rainfall during a specific period, primarily in the summer months.

(ii) Heaviest Rainfall in India : The place in India that receives the heaviest rainfall is Mawsynram, located in Meghalaya.

118. How does El-Nino affect the climate of India ?

Ans : COMP 2016

El Nino raises sea surface temperatures, disrupting the movement of monsoon winds in the Indian Ocean, leading to weakened monsoon conditions and creating drought-like situations in the Indian subcontinent.

119. Describe the climatic conditions that exist in the subcontinent before the South-West Monsoons.

Ans : MAIN 2008

Before the South-West Monsoons, the Indian subcontinent experiences high temperatures and dry conditions, leading to increased humidity in the air. The landscape often shows signs of drought, with parched soil and stressed vegetation. Additionally, pre-monsoon thunderstorms may occur, signaling the impending arrival of the monsoon rains.

120. (i) What is meant by a 'rain shadow area' ?
(ii) Give two examples of 'rain shadow' areas in India.

Ans : COMP 1996

(i) A rain shadow area is a region that receives very little rainfall because it is located on the leeward side of a mountain range. As moisture-laden winds rise over the mountains, they cool and release most of their moisture on the windward side, leaving the leeward side dry.

(ii) Two examples of rain shadow areas in India are :
(a) The Deccan Plateau, which lies in the rain shadow of the Western Ghats.
(b) Leh in Ladakh, which lies in the rain shadow of the Himalayas.

121. Mention two characteristics of the South-West Monsoon.

Ans : COMP 2014

(i) The monsoon is affected by the country's mountains and relief features. For instance, the western slopes of the Western Ghats receive heavy rainfall, whereas the eastern slopes experience scanty rainfall due to their location on the leeward side.

(ii) Monsoon rainfall in India is unevenly distributed. While Meghalaya receives over 200 cm of rainfall, the western regions of Rajasthan and Punjab receive only about 50-80 cm annually.

122. State two points of difference in climate between the northern and the southern zone of India due to latitude.

Ans : MAIN 2015

Aspect	**Northern Zone**	**Southern Zone**
Temperature	Extreme variations: hot summers, cold winters.	Milder climate with less variation.
Rainfall	Seasonal rainfall with high variability.	Consistent rainfall from the southwest monsoon.

123. State briefly the impact of water bodies on the climate in coastal areas.

Ans : SQP 2015

India is bordered by three major water bodies: the Indian Ocean, the Bay of Bengal, and the Arabian Sea, which significantly influence the climate, particularly in coastal regions. These water bodies serve as the primary source of moisture for the summer monsoons, bringing heavy rainfall to these areas. The proximity to the sea is a key reason why these regions enjoy a moderate climate.

124. State two characteristic features of North-East Monsoon.

Ans : MAIN 2017

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(i) Timing : Occurs from October to December, primarily affecting southeastern India, especially Tamil Nadu.
(ii) Moisture Source : Draws moisture from the Bay of Bengal, resulting in heavy and persistent rainfall along the eastern coast.

125. Define :
(i) Western Disturbances
(ii) Mango Showers

Ans : SQP 2018

(i) Western Disturbances : Western Disturbances are extratropical weather systems that originate in the Mediterranean region and move eastward, bringing moisture-laden winds to the Indian subcontinent. They typically cause winter rainfall in the northwestern regions of India, including Punjab, Haryana, and the Himalayan states, and can also lead to snowfall in the mountains.
(ii) Mango Showers : Mango Showers refer to pre-monsoon rainfall that occurs in South India, particularly in Kerala and Karnataka, during April and May. These light showers help in the growth of mangoes and other crops by providing necessary moisture before the arrival of the southwest monsoon.

126. What is meant by the season of 'Retreating Monsoons'?

Ans : COMP 2019

The "Retreating Monsoons" season refers to the period from October to November when the southwest monsoon winds withdraw from the Indian subcontinent. During this time, rainfall decreases, winds shift to the northeast, and temperatures cool, marking the end of the monsoon season. This transition also contributes to the North-East Monsoon, bringing rainfall to southeastern India.

127. What is meant by rain shadow area ? Give an example and state the mountains which are responsible for the rain shadow area.

Ans : MAIN 2013

A "rain shadow area" is a region that receives limited rainfall due to the presence of mountains aligned parallel to the monsoon winds. The western part of Rajasthan is an example of a rain shadow area, as it is situated near the Aravali ranges, which run parallel to the moisture-laden winds.

128. Give two points of difference between Tropical Cyclones and Temperate Cyclones.

Ans : COMP 2022

Aspect	**Tropical Cyclones**	**Temperate Cyclones**
Formation Location	Form over warm ocean waters near the equator, typically between 5° and 20° latitude.	Form in mid-latitude regions, typically between 30° and 60° latitude, often along fronts.
Structure and Intensity	Characterized by a well-defined center (eye), strong winds, and intense rainfall; usually more intense but smaller in size.	Have a less organized structure with a wider wind field, featuring fronts; generally less intense but larger in size.

129. Name the months which are known for retreating monsoon. Write two features of this climate.

Ans : MAIN 1999

Months of Retreating Monsoon : October and November.
Features :
(i) Decreasing Rainfall: The intensity of rainfall decreases as the southwest monsoon winds withdraw.
(ii) Temperature Moderation: This period leads to cooler temperatures, transitioning from hot, humid summer conditions to milder winter conditions.

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130. State the economic importance of Kalbaisakhis in West Bengal and Assam.

Ans : MAIN 2015

(i) Agricultural Benefits: It provides essential pre-monsoon rainfall in April and May, crucial for the growth of crops like rice, jute, and tea, enhancing agricultural productivity.

(ii) Water Supply: The rain replenishes water sources, ensuring adequate irrigation during the dry season, which supports farmers' livelihoods.

131. What is 'October Heat' ?

Ans : SQP 2000

"October Heat" refers to the period in India during October when temperatures can rise significantly, leading to hot and uncomfortable weather, especially in the northern and central regions. This phenomenon occurs just before the arrival of the northeast monsoon, when the monsoon winds have retreated but the summer heat still lingers. The high humidity levels combined with elevated temperatures can create oppressive conditions, often causing discomfort before the onset of cooler weather in November.

132. Give an account of the general weather conditions during the cold weather season in India.

Ans : COMP 2001

During the cold weather season (December to February), northern India experiences cool temperatures, with clear skies and low humidity. The northeast trade winds prevail, bringing dry conditions, except for some rainfall on the eastern coast. Occasionally, western disturbances cause light rain and snow in the north. Frost may occur in northern plains during early mornings.

133. (i) Name one region which gets rainfall from the Retreating Monsoon.

(ii) Name two areas which get more than 200 cm of rainfall in India.

Ans : SQP 2024

(i) Tamil Nadu.

(ii) (a) Mawsynram, Meghalaya.
(b) Cherrapunji, Meghalaya.

134. One of the prominent local winds that flow through India is Loo. The Loo is a strong, gusty, dusty wind that brings about the hot and dry summers that we often associate the country with. Loo blows from the west, over the Indo-Gangetic Plain, towards the parts of Northern India and Pakistan.

State the benefits that are derived from the local winds that blow in summer in the following areas

(i) Kerala

(ii) West Bengal.

Ans : MAIN 2020

(i) Mango Showers are local winds that bring rainfall to Kerala, aiding in the early ripening of mangoes.

(ii) In West Bengal, the local winds known as Kal Baisakhi deliver rain in April and May, which benefits the cultivation of jute and rice.

135. An Inter-School Football Match at Vishakhapatnam from November 1 to 3 had to be cancelled because of bad weather. Give an explanation for this happening. Your explanation should provide the technical name of this season in India, as well as the pressure conditions over the Bay of Bengal.

Ans : MAIN 2023

The cancellation of the Inter-School Football Match in Vishakhapatnam from November 1 to 3 was due to the Northeast Monsoon. During this season, low-pressure conditions over the Bay of Bengal lead to moisture-laden winds that can bring heavy rainfall and storms, resulting in adverse weather conditions that disrupt outdoor activities.

136. "The monsoons are known for their vagaries and uncertainties". Justify.

Ans : MAIN 2009

The alternation of dry and wet spells varies in intensity, frequency, and duration.

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While they can lead to heavy floods in one region, they may cause droughts in another. Additionally, the monsoons often arrive and retreat irregularly, disrupting the entire farming schedule for farmers.

137. 'Loo' blows over northern and north-western India during the summer season. What is the cause of this 'Loo' ?

Ans : SQP 2003

The 'Loo' is a hot, dry wind that blows over northern and north-western India during the summer season. It is caused by the extreme heating of the land in these regions during the months of May and June, leading to very high temperatures. As the land heats up, the air pressure decreases, and the intense heat causes the formation of these hot winds, which exacerbate the already hot conditions.

138. Why does Delhi receive more rain than Jodhpur ?

Ans : COMP 2006

Delhi, the capital of India, is situated in the northern plains and receives rainfall from both the Southwest Monsoons and the Northeast Monsoons. Additionally, Delhi gets about 2 cm of rainfall during the summer season due to local storms. Jodhpur receives less rainfall because:

(i) The Aravalli Hills do not block the southwest monsoon winds as they move parallel to the range.
(ii) The high temperature in the region causes the monsoon winds passing over the desert to dry out, resulting in minimal rainfall.

139. State any three features of hot weather season of India. Also write its duration.

Ans : MAIN 2002

(i) This period is marked by increasing temperatures and decreasing air pressure.
(ii) The North East trade winds are drawn towards India during this time.
(iii) The hot local wind, 'Loo,' blows across northern and northwestern India.
(iv) Duration: The season begins in March and lasts until June.

140. Give two points of difference between the Arabian Sea branch and the Bay of Bengal branch of South-West Monsoon Winds.

Ans : SQP 2021

Aspect	Arabian Sea Branch	Bay of Bengal Branch
Rainfall Distribution	Brings heavy rainfall to the western coast, especially the Western Ghats.	Causes heavy rainfall in northeastern states and the eastern coast.
Temperature Impact	Leads to a cooling effect along the western coast.	Increases humidity and warmer temperatures in the northeastern regions.

141. From where does the winter showers in Western Uttar Pradesh and Punjab originate?

Ans :

The winter showers in Western Uttar Pradesh and Punjab originate from Western Disturbances. These are extratropical weather systems that travel from the Mediterranean region, bringing moisture-laden winds that can result in light to moderate rainfall in these northern plains during the winter months.

142. Why does Mawsynram in Meghalaya receive the highest rainfall in the world ?

Ans : COMP 2004

Mawsynram receives the highest rainfall because it is located on the windward side of the Khasi Hills. The southwest monsoon winds from the Bay of Bengal are forced to rise, cool, and condense, resulting in heavy rainfall in the region.

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143. Why is Cherrapunji rainier than Kolkata ?

Ans : SQP 2016

Cherrapunji is rainier than Kolkata because it is located on the windward side of the Khasi Hills, where the southwest monsoon winds are forced to rise, cool, and condense, causing heavy rainfall. Kolkata, being on the plains, does not experience the same orographic effect and receives less rainfall as a result.

144. "Amount of rainfall decreases as we go westward from West Bengal to Punjab." Mention two reasons.

Ans : COMP 2011

(i) Both regions receive the majority of their rainfall from the summer monsoon branch originating from the Bay of Bengal, which travels up the Ganga valley. It cannot cross the high Himalayas and instead moves westward along the mountains. The lower Ganga valley receives rainfall first, followed by the upper Ganga valley, resulting in higher rainfall for Kolkata.

(ii) Subsequently, the monsoons move westward and become progressively drier as they travel further from the sea, leading to reduced rainfall in Punjab.

145. The Eastern coast of India, particularly Tamil Nadu remains relatively dry during the South-West monsoon period. Why ? Give two reasons.

Ans : COMP 2015

(i) Tamil Nadu is located in the rain shadow area of the Arabian Sea current.

(ii) It runs parallel to the Bay of Bengal monsoon current.

146. Write two characteristics of Arabian Sea Branch of South-West monsoons.

Ans : MAIN 2007

(i) The Arabian Sea branch originates from the Arabian Sea and hits the Western Ghats, resulting in heavy rainfall exceeding 250 cm along the windward side.

(ii) Another branch of these winds moves northeast, running parallel to the Aravalli Hills, and brings very little rainfall to the Thar Desert.

147. What type of climate would India have had, if the Arabian Sea, the Bay of Bengal and the Himalayas had not been there. Explain it with reference to temperature and precipitation.

Ans : COMP 2020

If the Arabian Sea, the Bay of Bengal, and the Himalayas were absent, India would experience a climate with more extreme temperatures and reduced precipitation.

(i) Temperature : Without the moderating effect of the Arabian Sea and Bay of Bengal, India would face hotter summers and colder winters, resulting in greater temperature extremes and a more continental climate.

(ii) Precipitation : The absence of the Himalayas would mean less rainfall, as moist air from the southwest monsoon would not be forced to rise and cool. This would lead to drier conditions, particularly in the northern and central regions, resulting in arid or semi-arid climates.

148. (i) What causes the winter rain along Coromandel coast?

(ii) Name a state which gets sufficient rainfall from the winter monsoon

Ans : MAIN 2000

(i) The winter rainfall along the Coromandel coast is mainly attributed to the North-East Monsoon, which brings moisture-rich winds from the Bay of Bengal. These winds cause substantial rainfall as they interact with the coastal areas during the winter months.

(ii) Tamil Nadu is a state that receives adequate rainfall from the winter monsoon.

149. Write two features of mango showers.

Ans : SQP 2013

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(i) Formation : Mango showers result from the interaction between dry and moist air masses, leading to precipitation in specific regions.
(ii) Geographical Occurrence : These showers are primarily observed toward the end of summer, particularly in Kerala and the coastal regions of Karnataka.

150. (i) What type of wind is 'Monsoon' ? What is its direction during summer ?
(ii) Mention two characteristics of the Indian monsoon.

Ans : SQP 2019

(i) Periodic Winds: Direction: South to West.
(ii) Seasonal Reversal of Winds : Characterized by hot and humid summers followed by cold and dry winters.

151. 'Leh has moderate precipitation almost throughout the year'. Give reason.

Ans :

Leh has moderate precipitation almost throughout the year because it is located in a cold desert region in the Himalayas, lying in the rain shadow area of the mountains. The high-altitude barriers block the moisture-laden winds, preventing heavy rainfall. As a result, Leh experiences only light and moderate precipitation, mostly in the form of snow during winter, with minimal rain during other seasons.

152. Name the coldest and the hottest parts of India. Give reasons for such extremities.

Ans : SQP 2010

Coldest Part : Dras, Jammu and Kashmir
Reason : Dras is extremely cold due to its high altitude in the Himalayas and its distance from large water bodies.
Hottest Part : Phalodi, Rajasthan
Reason : Phalodi experiences extreme heat because of its location in the Thar Desert, characterized by low elevation, sparse vegetation, and minimal water bodies.

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153. Give reason:
(i) Though Mangalore and Mysore are on the same latitude, Mangalore experiences more rainfall than Mysore.
(ii) Jaipur has a higher annual range of temperature than Mumbai.

Ans : MAIN 2018

(i) Despite being on the same latitude, Mangalore receives more rainfall than Mysore because it is located on the windward side of the Western Ghats, where it benefits from heavy rainfall brought by the southwest monsoon winds. In contrast, Mysore lies on the leeward side, where the Western Ghats create a rain shadow effect, leading to much lower precipitation.
(ii) Jaipur experiences a greater annual temperature range than Mumbai because it is situated inland, away from the moderating influence of the sea. This results in more extreme weather, with scorching summers and chilly winters. On the other hand, Mumbai, being a coastal city, enjoys milder temperatures year-round due to the Arabian Sea's stabilizing effect, which minimizes temperature variations.

154. (i) Name the seasons during which the North- East Trade Winds dominate.
(ii) How do these winds affect the climate of India ?

Ans : COMP 2022

(i) The North-East Trade Winds prevail during the winter season, from November to March.
(ii) These winds impact India's climate in several ways:
(a) Dry Conditions: The North-East Trade Winds blow from land to sea, resulting in dry conditions across most parts of the country, particularly in the interior regions.
(b) Temperature Regulation: They help moderate temperatures in winter, keeping the northwestern areas of India cooler.

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155. Write any two main features of South-West Monsoon branch originating from Bay of Bengal branch.

Ans : SQP 2008

(i) The first branch enters the Garo, Khasi, and Jaintia Hills of Meghalaya after crossing the Ganga Delta, causing heavy rainfall. Cherrapunji and Mawsynram receive rainfall from this branch.

(ii) The second branch moves towards the Himalayas and, upon reaching there, shifts westward.

156. Why do the North-East trade winds change their direction while blowing through the Ganga valley ?

Ans : MAIN 2012

During the winter season, the North-East trade winds blow over the Northern plains, where high pressure develops in the northeastern region. Consequently, these winds begin to flow outward towards the Ganges valley, maintaining a north-easterly direction. However, the topography of the Ganga valley influences the wind direction, causing the winds to change to a westerly and north-westerly orientation as they move down the valley.

157. Give a reason for each of the following:

(i) Patna gets heavier rainfall than Varanasi.

(ii) The Arabian Sea branch of the South-West Monsoon does not shed any moisture in western Rajasthan.

Ans : SQP 2020

(i) Patna receives more rainfall than Varanasi as it is located in the lower Ganga valley, while Varanasi lies further west. The Bay of Bengal branch of the South-West Monsoon brings rain to Patna before reaching Varanasi.

(ii) Western Rajasthan remains dry as the Arabian Sea branch of the South-West Monsoon does not release moisture in the region. The Aravalli Range creates a rain shadow effect, causing the winds to lose most of their moisture before reaching this area.

158. (i) Name two regions which get very little rain from the Summer Monsoon.

(ii) Name any two local winds which blow in India during the summer season.

Ans : SQP 2021

(i) Western Rajasthan and the Thar Desert are two regions that receive minimal rainfall from the Summer Monsoon.

(ii) Two local winds that occur in India during the summer season are the Loo and Kaal Baisakhi.

159. With reference to the summer season in India, answer the following questions :

(i) Mention the duration of the summer season in India.

(ii) What is the atmospheric pressure condition during summer season over the central part of India ?

Ans : MAIN 2019

(i) Duration: March to May.

(ii) Atmospheric Pressure: High atmospheric pressure prevails.

160. Give a reason for each of the following:

(i) Most of Sri Lanka has Equatorial type of climate.

(ii) Western coastal plains receive more rainfall than the Eastern coastal plains.

Ans : COMP 2016

(i) Sri Lanka predominantly experiences an equatorial climate because of its closeness to the equator, resulting in warm conditions with minimal temperature fluctuations and substantial rainfall from both the southwest and northeast monsoons.

(ii) The western coastal plains get more rainfall than the eastern coastal plains as they are situated on the windward side of the Western Ghats, receiving heavy rainfall from the southwest monsoon. Meanwhile, the eastern coastal plains are in the rain shadow region, leading to lower rainfall.

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161. How do Himalayas act as 'climate divide' ?

Ans : COMP 2002

(i) Blocking cold winds from Central Asia, keeping northern India warmer in winter.
(ii) Forcing monsoon winds to rise, causing rainfall on the windward side and a rain shadow on the leeward side.

162. Mention any four features of the distributions of annual rainfall in India.

Ans : MAIN 2014

(i) The Western Coastal region and Northeastern India experience over 300 cm of rainfall annually.
(ii) Annual rainfall in Western Rajasthan and nearby regions of Gujarat, Haryana, and Punjab is less than 50 cm.
(iii) Snowfall occurs primarily in the Himalayan region.
(iv) Monsoon Influence: Although these winds are primarily dry, they play a role in the overall atmospheric circulation, which ultimately affects the onset and intensity of the southwest monsoon later in the year.

163. Briefly explain the role of the Himalayas in determining the climate of India during :
(i) the hot weather season ;
(ii) the southwest monsoon season

Ans :

(i) During the hot weather season, the Himalayas serve two key functions. First, they act as a barrier that prevents the expansion of the Middle Asian desert into the Indian peninsula, standing between two distinct physical formations. Second, their elevated altitudes help cool the climate by moderating land breezes that flow toward the sea, bringing cooler temperatures to the Indian plains. Additionally, the humid, moisture-rich monsoon winds from the low-pressure area over the Bay of Bengal encounter the Himalayas, resulting in significant rainfall across a large region.

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(ii) During the southwest monsoon season, the Himalayas trap the southwest monsoon winds, causing heavy rainfall throughout India.

164. (i) What is the retreating monsoon and name any two months associated with them.
(ii) Normally by what date does the monsoon advance into Kerala ?

Ans : SQP 2008

(i) The retreating monsoon refers to the phase of the monsoon season when the southwest monsoon winds start to pull back from the Indian subcontinent, resulting in a decrease in rainfall. This period is usually marked by dry weather following the heavy rains of the monsoon. October and November are the two months commonly associated with the retreating monsoon.
(ii) The monsoon usually arrives in Kerala by June 1st.

165. Give two important characteristics of the Summer monsoon rainfall in India.

Ans : SQP 2001

(i) Seasonal and concentrated : The rainfall is concentrated during the months of June to September, accounting for nearly 75% to 90% of the total annual rainfall in most regions.
(ii) The rainfall is not evenly spread across the country; coastal and northeastern regions receive heavy rainfall, while interior and northwestern regions receive less.

166. Give reason why the entire South Asia experiences tropical monsoon climate.

Ans : MAIN 2003

(i) The Great Himalayas to the north of India serve as a barrier, preventing the cold winds from North Asia from reaching South Asia.
(ii) The climate of most of South Asia is shaped by the monsoon winds, giving it a distinctive characteristic or feature.

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167. Name any two local winds which blow in India and write briefly about each.

Ans : MAIN 2002

(i) Loo : This is a hot and dry wind that blows across the northern plains of India.
(ii) Land Breeze : This wind occurs in coastal areas, blowing from the land towards the sea.

THREE MARKS QUESTIONS

168. Give a geographical reason for the following:
(i) Kolkata gets more rain than Delhi during rainy season.
(ii) Though both are hill stations, Shimla experiences snowfall during the winters but Ooty does not.
(iii) Winter monsoons bring less rain.

Ans : MAIN 2024

(i) Kolkata is closer to the Bay of Bengal and lies directly in the path of the moisture-laden southwest monsoon winds, receiving heavy rainfall, whereas Delhi is located further inland and gets less rainfall.
(ii) Shimla is located in the Himalayas at a much higher altitude and latitude, which causes it to experience colder temperatures and snowfall in winter, while Ooty is located in the lower Nilgiri Hills, closer to the equator, where temperatures remain milder.
(iii) The winter monsoon winds blow from the land to the sea, carrying dry continental air with very little moisture, leading to much lower rainfall compared to the summer monsoon.

169. Give a geographical reason for each of the following :
(i) Kanyakumari experience an equable climate?
(ii) Chennai has a lower annual range of temperature than Lucknow?
(iii) Mangalore experiences more rainfall than Mysore.

Ans : SQP 2002

(i) Kanyakumari is located at 8 degrees North, placing it closer to the Equator. It receives direct sunlight, leading to minimal temperature variation throughout the year. Therefore, we can conclude that Kanyakumari has an equable, oceanic, or maritime climate.
(ii) Chennai enjoys an equable or oceanic climate due to the influence of the sea, whereas Lucknow, being inland, experiences a continental climate with more extreme conditions. Consequently, Lucknow has a greater annual temperature range compared to Chennai.
(iii) Mangalore is situated on the windward side of the Western Ghats, while Mysore is located on the leeward side. This geographic difference accounts for Mangalore receiving more rainfall than Mysore.

170. Give reasons for the following :
(i) The North East Monsoons bring almost no rain to most of India.
(ii) The Mango showers are beneficial local winds.
(iii) The latitudinal extent of India is responsible for the variation in the climatic conditions which prevail in the country.

Ans : SQP 2012

(i) These winds blow from the land towards the sea in most regions of the country.
(ii) These winds supply the necessary moisture for the growth of mango, tea, and coffee plants.
(iii) India is situated between 8°N and 37°N latitudes, with the Tropic of Cancer running through its middle. The southern region falls within the tropical zone, while the northern region is in the sub-tropical zone, resulting in generally high temperatures during the summer season across the country, except in areas with high altitudes.

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171. Give a reason for each of the following :
(i) Goa receives heavier rainfall than Puducherry.
(ii) Mawsynram receives the highest average annual rainfall.
(iii) Mangaluru is cooler than Delhi in summer season.

Ans : COMP 2019

(i) Geographical Location : Goa is located on the windward side of the Western Ghats, while Puducherry is situated on the Eastern Ghats.
(ii) Mawsynram's Rainfall : Mawsynram, located in the Khasi Hills of Meghalaya, receives heavy rainfall from the Bay of Bengal branch of the summer monsoon. The funnel-shaped hills force the moisture-laden monsoon winds to rise suddenly, resulting in heavy rainfall.
(iii) Temperature Comparison: Mangaluru experiences cooler temperatures due to the moderating effect of the sea, while Delhi, being inland, has higher temperatures typical of the interior Indian subcontinent.

172. (i) Name one part of India that receives rainfall both in the winter and summer.
(ii) What is the general direction of prevailing winds over the Indian subcontinent :
(a) In April-May ?
(b) In July ?
(iii) Why does much of the central Maharashtra has only light rainfall ?

Ans : COMP 1995, 2013

(i) Punjab, In winter, Punjab gets its rainfall from temperate cyclones and in summer from S-W monsoons.
(ii) (a) In April-May : The winds generally blow from the northwest.
(b) In July : The winds blow from the southwest, bringing the southwest monsoon.
(iii) Much of central Maharashtra receives only light rainfall because it lies in the rain shadow area of the Western Ghats. The moisture-laden winds from the Arabian Sea lose most of their moisture on the windward side of the Western Ghats, leaving the leeward side, including central Maharashtra, relatively dry.

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173. Mumbai receives rainfall in summer season while Chennai in October to December, why?

Ans : SQP 2009

Mumbai gets rainfall in the summer due to the southwest monsoon winds from the Arabian Sea, bringing rain from June to September.
Chennai receives rainfall from October to December because of the northeast monsoon winds from the Bay of Bengal during the retreating monsoon.

174. 'Rainfall in India in orographic in nature'. Give an example with reference to the distribution of rainfall and the effect of relief on its distribution.

Ans : MAIN 2011

In India, orographic rainfall occurs when moist air is forced to rise over mountains, cooling and condensing to form precipitation. An example is the Western Ghats. During the monsoon, winds from the Arabian Sea bring moisture, which causes heavy rainfall on the windward side, such as in Munnar and the Konkan coast. On the leeward side, the air descends, warming and drying, leading to much lower rainfall in areas like parts of Maharashtra and Karnataka, creating a rain shadow effect.

175. Give a geographical reason for each of the following :
(i) The Malabar coast receives heavy rainfall in the month of July but the Coromandel coast during this time remains comparatively dry.
(ii) Punjab receives rainfall in winter season.
(iii) Mumbai is warmer than Delhi in the month of December.

Ans : MAIN 2023

(i) The Malabar coast receives heavy rainfall in July due to the southwest monsoon winds, which bring moisture-laden air

from the Arabian Sea. In contrast, the Coromandel coast remains comparatively dry during this time because it lies in the rain shadow of the Western Ghats, blocking the monsoon winds from reaching this region.

(ii) Punjab receives rainfall in the winter season due to the western disturbances, which are moisture-laden winds originating from the Mediterranean region. These winds bring light to moderate rainfall to northwestern India, including Punjab, during the winter months.

(iii) Mumbai is warmer than Delhi in December because of its coastal location, which moderates the temperature due to the influence of the Arabian Sea. In contrast, Delhi is located inland and experiences more extreme temperatures, leading to colder winters.

176. Western Rajasthan receives less rain. Write two reasons.

or

"Thar Desert gets very little rain". Give two reasons.

Ans : MAIN 1998,2006,2008

(i) Lack of Physical Barriers in Western Rajasthan (Jodhpur): The region receives minimal rainfall from the Arabian Sea branch of the monsoons because there are no significant physical obstacles, like the Himalayas, to obstruct or force the winds to rise and condense.

(ii) Orientation of the Aravalli Hills: The Aravalli Range lies parallel to the direction of the monsoon winds, allowing them to pass through without any hindrance, which results in scanty rainfall.

(iii) High Summer Temperatures Drying the Monsoon Winds: During the summer, the region's extremely high temperatures cause the monsoon winds to become dry, preventing them from producing rain.

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177. "Chennai gets more rainfall in winter than in summer'. Give two reasons.

or

"The Coromandel Coast gets most of its rain during the winter season". Give reason.

Ans : COMP 2011,2013

(i) Tropical Cyclones in the Bay of Bengal and Indian Ocean: During October and November, tropical cyclones originate over these waters, causing heavy rainfall along the coasts of Tamil Nadu, Andhra Pradesh, and Odisha.

(ii) Moisture Picked Up by the Northeast Monsoon: As the Northeast Monsoon crosses the Bay of Bengal during October and November, it absorbs moisture and brings rainfall to the region.

(iii) Reduced Rainfall from the Summer Monsoon Due to Rain Shadow Effect: The area receives less rainfall from the summer monsoon because it lies in the rain shadow region of the Bay of Bengal branch.

178. What is the name given to the climate of India ? Mention any two factors responsible for such a type of climate.

Ans : MAIN 2016,2011

Tropical Monsoon Type

(i) Variation in Atmospheric Pressure : In the summer season, low-pressure conditions dominate the North-Western plains, which attract trade winds from the Southern Hemisphere.

(ii) Temperature Differences : Summer temperatures in the North-West can reach as high as 47°C, whereas the southern parts of India do not experience such extreme heat. This temperature variation also facilitates wind movement.

(iii) Role of Jet Streams : The origin of monsoons is thought to be closely linked to the presence of jet streams in the upper troposphere.

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179. Name the factors which influence the climate of India or South Asia.

Ans : MAIN 2007,2015

(i) The Himalayan Mountain Range : This mountain chain acts as a barrier, shielding the Indian subcontinent from the cold winds originating in Central Asia and obstructing the southwest monsoon.

(ii) Extensive Coastline : South India, as a peninsula, boasts a long coastline, which contributes to its maritime climate.

(iii) Jet Streams : The upper atmospheric air currents, known as jet streams, facilitate the entry of western disturbances into India.

(iv) Location and vast extent of the country : India is a vast country. It is located between 8°N and 37°6′N latitude and 68°7′E to 97°2E longitude. India is divided in almost two equal parts by the Tropic of Cancer.

180. State two differences between tropical cyclones and temperate cyclones.

Ans :

Temperate cyclones	Tropical cyclones
The origin and influence of these cyclones is in the temperate zone due to which they are known as temperate cyclones.	These cyclones originate and travel in the tropical zone and are known as tropical cyclones.
The wind velocity is very low.	The wind velocity is very high.
They are more active in winter season.	They are more active in summer season.

181. Which type of climate is experienced in the Northern plains of India? State two characteristics of this type of climate.

Ans : SQP 2007

Monsoon Climate.

(i) Seasonal Reversal of Winds: There is a change in wind direction with the seasons.

(ii) Temperature Variation: The summer is hot and humid, while the winter is cold and dry.

(iii) Rainfall Distribution: The majority of rainfall occurs over a span of only two to three months.

182. How will you differentiate between SW monsoon and NE monsoon ?

or

Write three differences between summer monsoons and retreating monsoon.

Ans : SQP 2018

Differentiate between SW monsoon and NE monsoon are as follows :

Aspects	South West Monsoon	North East Monsoon
Months	They blow June to September.	They blow during December to February.
Rainfall	These causes heavy rainfall throughout India.	They causes rain-fall in east coast of India.
Weather Conditions	Very hot at landmass less hot at the ocean.	Very low temperature at landmass but relatively high in ocean.
Direction of Wind	South-West and from ocean to land.	North-East and from land to ocean.

183. What is the direction of the summer monsoon ? Why ?

Ans : COMP 2012

The direction of the summer monsoon in India is from the southwest. This occurs because the intense heat during summer creates a low-pressure area over the Indian subcontinent, while a high-pressure area develops over the Indian Ocean. The pressure difference causes

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the moisture-laden winds to move from the high-pressure region over the Indian Ocean towards the low-pressure region over the land, resulting in southwest monsoon winds.

184. Give geographical reasons for the following :
(i) Even in summer Shimla is cooler than Delhi.
(ii) The northern plains of India do not freeze in winter.
(iii) Kochi has a lesser annual range of temperature than Agra.

Ans : SQP 2012

(i) Shimla is cooler than Delhi due to its higher altitude.
(ii) The northern plains don't freeze in winter as the Himalayas block cold winds.
(iii) Kochi has a smaller temperature range because of its coastal location, unlike inland Agra.

185. (i) Mention two differences in the climatic conditions which prevail over Kerala and Uttar Pradesh in the month of June.
(ii) Name :
(a) The source of winter rain to Punjab.
(b) The source of the winter rain to Tamil Nadu.

Ans : COMP 2010

(i)

Climatic conditions (Kerala) June	**Climate conditions (Uttar Pradesh) June**
Due to moderate effect of sea Kerala has lower temperature (Average 25°C).	Due to continental effect Uttar Pradesh has higher average temperature (30°C).
Monsoon winds strike the coast of Kerala by 1st June.	Monsoon winds strikes Uttar Pradesh by 15th June.
The region receive heavy rainfall during the months i.e., more than 50 cm.	The region also receive good amount of rainfall but lesser than Kerala (Average 30 cm)

(ii) (a) Temperate cyclone.
(b) South-East trade winds.

186. Give a geographic reason for each of the following:
(i) Kerala has the longest rainy season.
(ii) The Konkan coast experiences orographic rainfall.
(iii) The city of Kanpur in Uttar Pradesh has a higher range of temperature than that of Chennai in Tamil Nadu.

Ans : COMP 2015

(i) Kerala has the longest rainy season because it is the first state to receive the southwest monsoon and the last to see its withdrawal, resulting in an extended rainy period.
(ii) Orographic rainfall occurs when air is uplifted by relief features like mountains. The Western Ghats rise steeply from the Western Coastal plains, running parallel to the coastline. This mountain range forces the moisture-laden southwest monsoons from the Arabian Sea to ascend the slopes, resulting in heavy rainfall in the Western Coastal Plain and the Konkan coast.
(iii) Kanpur has a higher range of temperature than Chennai because Kanpur is inland, experiencing continental climate, while Chennai is coastal, with the sea moderating its temperatures.

187. Give a geographical reason for each of the following :
(i) Kanpur has extreme temperature conditions.
(ii) Kochi is warmer than Mumbai even though both lie on the western coast of India.
(iii) The Ganga Plain gets the monsoon rain much later than the west coast of India.

Ans : COMP 2016

(i) Kanpur is situated inland in northern India, away from large water bodies, resulting in significant temperature variations and extreme hot summers and cold winters.

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(ii) Kochi is located further south and closer to the equator, leading to higher average temperatures due to its tropical climate, while Mumbai experiences a more moderate climate influenced by the Arabian Sea.

(iii) The Arabian Sea branch of the southwest monsoon hits the western coast on June 1st, while it reaches the Ganga plains two weeks later.

188. Give a geographical reason for each of the following :

(i) When the Malabar coast is receiving heavy rainfall in July, the Tamil Nadu coast is comparatively dry.

(ii) The Northern Plains of India have a Continental type of climate.

(iii) Central Maharashtra receives less rainfall than Western Maharashtra.

Ans : MAIN 2016

(i) The Malabar coast is located on the windward side of the Western Ghats, where the southwest monsoon winds bring heavy rainfall. In contrast, the Tamil Nadu coast lies on the leeward side, experiencing the rain shadow effect, resulting in significantly less rainfall.

(ii) The Northern Plains are situated inland, away from the moderating influence of the seas. This leads to greater temperature extremes, with hot summers and cold winters, characteristic of a continental climate.

(iii) Western Maharashtra is located on the windward side of the Western Ghats, where the southwest monsoon winds bring substantial rainfall. In contrast, Central Maharashtra, being further inland, is in the rain shadow region and thus receives less precipitation.

189. Distinguish between Windward and Leeward side.

Ans : SQP 2007

Western coastal plain lies in the windward side whereas Eastern plain lies in the leeward side.

Windward Side	**Leeward Side**
The windward side of a mountain is the area that faces the prevailing winds.	The leeward side of a mountain is the area shielded from the prevailing winds.
This side experiences heavy rainfall.	This side receives less rainfall.
Panji, located on the windward side of the Western Ghats, receives over 200 cm of rainfall annually.	Pune, situated on the leeward side of the Western Ghats, receives less than 150 cm of annual rainfall.

190. affect its climate ? Explain it with three examples.

Ans : COMP 2016

India is located between 8°N and 37°N latitude and 68°E to 97°E longitude. The Tropic of Cancer nearly divides the country into two equal halves.

(i) Tropical Climate: Due to its proximity to the Equator, India experiences a tropical climate characterized by warm temperatures and seasonal rainfall.

(ii) Himalayan Protection: The Himalayas serve as a barrier against cold northern winds, preventing extreme cold in the northern plains.

(iii) Moderating Influence of the Sea: The surrounding Indian Ocean, Arabian Sea, and Bay of Bengal exert a moderating effect on the climate, leading to milder temperatures and higher humidity in the coastal regions.

191. Give a geographical reason for each of the following :

(i) Mumbai is warmer than Kanpur in December.

(ii) Punjab gets rain in winter.

(iii) The Indo - Gangetic Plain gets some rainfall in the months of December and January.

Ans : MAIN 2022

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(i) In December, Mumbai is warmer than Kanpur because its maritime climate, shaped by its closeness to the Arabian Sea, results in mild temperatures, whereas Kanpur's inland position leads to cooler winter weather.

(ii) Punjab experiences winter rainfall due to western disturbances, which are moisture-rich systems from the Mediterranean that deliver precipitation during the winter months.

(iii) The Indo-Gangetic Plain receives some rainfall in December and January as a result of winter rainfall from western disturbances, which cause cloud formation and light to moderate precipitation during this period.

192. Give a geographical reason for each of the following:

(i) Pune receives less rainfall than Mumbai.

(ii) Tropical cyclones bring heavy rainfall but temperate cyclones bring light rainfall.

(iii) Kerala has a tropical climate while Punjab has a continental climate.

Ans : SQP 2019

(i) Pune is situated inland and on the leeward side of the Western Ghats, which causes it to experience the rain shadow effect and receive lower rainfall. In contrast, Mumbai, located on the windward side, receives heavy precipitation from the southwest monsoon.

(ii) Tropical cyclones develop over warm ocean waters, absorbing moisture and resulting in heavy rainfall. In contrast, temperate cyclones, which form over cooler areas, typically have lower moisture content, leading to lighter precipitation.

(iii) Kerala's location near the equator gives it a tropical climate with high temperatures and substantial rainfall year-round. In contrast, Punjab's position further north, away from the sea's moderating influence, results in greater temperature variations and a continental climate characterized by hot summers and cold winters.

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193. Mention three important features of rainfall in India.

Ans : MAIN 2024

The main features of rainfall in India are :

(i) Rainfall occurs over a span of three months, while the remainder of the year is largely dry, with seventy percent of the annual precipitation falling during the monsoon season.

(ii) A small portion of rainfall originates from non-monsoon sources, including cyclonic and convectional rainfall.

(iii) The quantity and timing of rainfall are unpredictable due to its erratic nature, resulting in occurrences of both floods and droughts stemming from this uncertainty.

194. How does the location and extent of India How does relief affect the climate of India ? Explain with three specific examples.

Ans : COMP 2017

Relief plays a crucial role in shaping India's climate through variations in altitude and topography. Here are three examples:

(i) **Western Ghats :** These mountains obstruct the southwest monsoon winds, resulting in heavy rainfall on the windward side (Maharashtra, Kerala) while creating dry conditions on the leeward side (Deccan Plateau) due to the rain shadow effect.

(ii) **Himalayan Region :** The Himalayas block cold winds from Central Asia, keeping the northern plains warmer during winter. Additionally, their snow-capped peaks lead to increased precipitation in the foothills and valleys.

(iii) **Thar Desert :** The Thar Desert experiences extreme temperatures and low rainfall due to its arid relief, with high daytime temperatures and substantial drops at night. Its position in the rain shadow of the Aravalli Range further contributes to its dryness.

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195. Distinguish between 'Burst of Monsoon' and 'Break of Monsoon'.

Ans : COMP 2020

Feature	Burst of Monsoon	Break of Monsoon
Definition	Sudden onset of heavy rains after dry weather	Temporary cessation or reduction in rainfall
Timing	Typically occurs in early June	Often occurs in July or August
Impact on Agriculture	Initiates sowing of kharif crops	Can delay sowing or affect crop growth due to insufficient moisture
Overall Significance	Marks the beginning of the rainy season	Indicates fluctuations in rainfall distribution

196. Give a geographical reason for each of the following :

(i) Western part of Rajasthan is a desert region.

(ii) Kochi has a lesser annual range of temperature than Agra.

(iii) The Northern plains and Punjab receive winter cyclonic rain in winter.

Ans : MAIN 2023

(i) The western part of Rajasthan is categorized as a desert for several reasons:
- (a) It receives very little rainfall during the summer.
- (b) By the time the Bay of Bengal branch of the Southwest Monsoon reaches Thar after passing through the Ganga Valley, it carries little to no moisture. Only the windward side of the Aravalli Hills receives some rain, while the Thar remains dry as it is situated in a rain shadow area.
- (c) The Aravalli Hills run parallel to the Arabian Sea branch of the Southwest Monsoon, leading to minimal rainfall.
- (d) The North-East Monsoon does not provide significant winter rainfall.

(ii) Kochi has a smaller annual temperature range compared to Agra because Agra is located in a continental region, while Kochi lies along the coast. The influence of land and sea breezes helps maintain moderate temperatures in Kochi.

(iii) The source of winter rainfall in the northern plains and Punjab is cyclonic precipitation linked to western disturbances that enter the subcontinent from the northwest.

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197. Give a geographical reason for each of the following :

(i) The monsoon rain is unevenly distributed over India.

(ii) Excessive cold in north India during winter season.

(iii) Most of the India remains dry during North-East Monsoon.

Ans : MAIN 2017

(i) The amount of rainfall an area receives is affected by its relief. For example, the windward side of mountains receives more rain, while the leeward side gets less. This variation is why monsoon rainfall is unevenly distributed across India.

(ii) The extreme cold in northern India during winter can be attributed to several factors:
- (a) In February, cold winds from the Caspian Sea and Turkmenistan bring cold waves to the northwestern regions of India.
- (b) Punjab, Haryana, and Rajasthan experience a continental climate due to their distance from the sea, which limits the moderating effect of maritime air.
- (c) Snowfall in the nearby Himalayan ranges contributes to the cold wave conditions.

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(iii) The North-East trade winds dominate the country, blowing from land to sea and leading to a dry season for most parts of India.

198. Give reason :
(i) India is known as the 'Land of the endless growing season'.
(ii) The South west Monsoons approach U.P. from the east.
(iii) Western Rajasthan is the region with the lowest pressure in May.
(iv) The monsoon acts as a unifying bond.

Ans : MAIN 2006

(i) India has a subtropical climate that supports the growth of a wide variety of crops. The key to the country's continuous growing season lies in its diverse relief, the range of daily and annual temperatures, and the varying amounts and duration of rainfall.
(ii) The majority of rainfall in Uttar Pradesh is derived from the Bay of Bengal branch of the southwest monsoons, which is redirected by the Arakan Yoma range in Myanmar. In contrast, Uttar Pradesh is far removed from the influence of the Arabian Sea branch of the southwest monsoon.
(iii) Western Rajasthan experiences the lowest atmospheric pressure due to high temperatures that can reach up to 48°C, as pressure and temperature are inversely related.
(iv) Despite climatic contrasts and regional variations, the monsoons establish a rhythmic cycle of seasons each year. This seasonal rhythm shapes the Indian landscape, influences its flora and fauna, dictates the agricultural calendar, and impacts the daily lives of the Indian people, including their festivals.

199. Describe the main features of Advancing Monsoon under the following heads :
(i) Duration
(ii) Pressure conditions
(iii) Prevailing winds
(iv) Rainfall

Ans : COMP 2010

(i) **Duration :** The advancing monsoon typically occurs during the months of June, July, August, and September. This period signifies the transition from the dry season to the wet season as the monsoon progresses across the Indian subcontinent.
(ii) **Pressure Conditions :** During this time, a low-pressure system dominates the northwestern plains of India, creating a strong draw for moisture-laden winds. In contrast, the ocean regions, especially the Indian Ocean, experience high pressure, facilitating the movement of winds toward the low-pressure areas on land.
(iii) **Prevailing Winds :** The prevailing winds during the advancing monsoon are the southeast trade winds. After crossing the equator, these winds shift to a southwesterly direction as they approach the Indian subcontinent, carrying moisture from the ocean.
(iv) **Rainfall :** The advancing monsoon brings substantial rainfall, particularly to the northeastern states of India, where the precipitation is often heavy. This rainfall is crucial for agriculture, replenishing water supplies, and sustaining the diverse ecosystems in these regions.

200. Give a geographical reason for each of the following :
(i) Chennai receives less rain than Thiruvananthapuram although it has more rainy days.
(ii) Shillong gets less than 200 cm of rainfall in a year while Cherrapunji receives more than 1250 cm of rainfall.
(iii) Jaipur has a higher annual range of temperature than Mumbai.

Ans : COMP 2004

(i) Chennai receives rainfall from the northeast monsoons during October-November, which is relatively weak, resulting in less precipitation. In contrast, Thiruvananthapuram in Kerala experiences heavy rainfall from the more powerful southwest monsoons.

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(ii) Shillong receives only 250 cm of rainfall because it is situated on the leeward side of the Garo, Khasi, and Jaintia Hills, placing it in a rain shadow area. In contrast, Cherrapunji receives substantial rainfall of 1250 cm as it is located on the windward slopes of these hills.

(iii) Jaipur has a higher annual temperature range because it is far from the sea's influence and lies inland. Winters are very cold, while summers are warm to hot. In comparison, Mumbai, influenced by the sea, has a smaller annual temperature range.

201. Give reasons for the following:

(i) The North-East Monsoons bring almost no rain to most of India.

(ii) The mango showers are beneficial local winds.

(iii) The latitudinal extent of India is responsible for the variation in the climatic conditions which prevail in the country.

Ans : SQP 2014

(i) The North-East Monsoon winds begin over land and stay dry until they pass over the Bay of Bengal. Once over the bay, they gather moisture and cause some rainfall along the eastern coast of the Deccan Plateau. Consequently, they bring minimal rainfall to the majority of India.

(ii) Mango showers take place in South India when winds from the Arabian Sea bring rain to regions near Mahabaleshwar. These rains are advantageous for the growth of mango, coffee, and tea crops.

(iii) India's northern region lies in the temperate zone, which results in cooler temperatures. Conversely, areas south of the Tropic of Cancer fall within the tropical zone, leading to warmer climates. Therefore, climatic variations are shaped by a location's proximity to the equator.

202. Describe the main features of cold season under the following heads :

(i) Duration

(ii) Pressure conditions

(iii) Prevailing winds

(iv) Rainfall

Ans : MAIN 2012

(i) Duration: The winter monsoon lasts from December to February, characterized by cooler temperatures and shifts in weather patterns across India.

(ii) Pressure Conditions: High pressure dominates the northern plains during winter, leading to stable weather with clear skies and cooler temperatures.

(iii) Prevailing Winds: The prevailing winds during this season are the northeast trade winds, which flow from high-pressure areas in the northern plains toward lower-pressure regions over the sea.

(iv) Rainfall: Rainfall during the winter monsoon primarily occurs along the southeastern coast and in the northwestern part of India. While the precipitation is often light, it can be substantial in states like Tamil Nadu, particularly during the northeast monsoon.

MAP BASED QUESTION

203. Study the climate data of Station X and answer the questions that follow:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp C	8.4	11.5	21.6	28.3	35.1	38.5	41.0	38.0	30.8	29.2	15.6	10.2
Rainfall cms	1.5	0.9	0.5	_	_	12.5	17.8	18.5	12.5	12.5	6.2	2.1

(i) Calculate the annual range of temperature of Station X.

(ii) Name the rainiest month of the Station X.

(iii) Is the Station X located in coastal area or in the continental interior?

Ans : MAIN 2024

(i) Annual range of the temperature = Maximum temperature - Minimum temperature
= 4(i)0 - 8.4

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= 3(ii)6° C

(ii) August has the highest rainfall, averaging 18.5 cm.

(iii) Given the significant variation in annual temperatures, which indicates a continental climate, Station X is more likely located inland rather than along the coast.

204. Study the climate data of Station X and answer the questions that follow: [3]

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp in °C	21.0	21.9	24.3	27.2	28.0	26.4	26.1	25.4	26.0	26.0	23.8	21.2
Rainfall in cm	5.1	2.8	1.2	1.7	3.9	4.6	8.4	11.4	11.9	31.6	34.5	14.8

(i) Calculate the annual range of temperature of Station X.

(ii) Name the wind that brings most of the rainfall to this station.

(iii) On which coast of India is Station X located?

Ans : MAIN 2023

(i) Annual range of temperature = (28.0 – 2(i)0)°C = 7°C

(ii) The Retreating Monsoons

(iii) The station X lies on the eastern coast of South India.

205. Study the data of distribution of temperature and rain for Station X and answer the questions that follow :

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temp. (°C)	10	11	23	35	39	42	40	33	30	25	13	11
Rainfall (cms.)	2	1	0	5	15	62	71	81	59	12	10	3

(i) Is Station X in the coastal area or in the interior of the country ?

(ii) Calculate the total annual rainfall for Station X.

(iii) Name the wind that brings most of the rainfall to Station X.

Ans : MAIN 2009

(i) As temperature range is very high so station X is in the interior of the country.

(ii) Annual rainfall = 2 + 1 + 0 + 5 + 15 + 62 + 71 + 81 + 59 + 12 + 10 + 3 = 321 cm.

(iii) South-west monsoon

206. Study the climatic data provided below and answer the questions that follow :

Month	J	F	M	A	M	J	J	A	S	O	N	D
Temp °C	21.0	22.6	26.3	29.2	29.7	27.5	25.1	24.5	24.8	25.5	22.5	20.5
Rain cm	0.1	0.1	0.5	1.5	2.7	11.4	16.7	9.0	13.4	9.0	2.7	0.3
Temp. °C	24.4	24.4	26.7	28.3	30.0	28.9	27.2	27.2	27.2	28.3	27.2	25.0
Rain cm	0.2	0.3	0.3	1.7	1.9	50.2	61.0	37.0	27.0	4.8	1.4	0.3

(i) Calculate the annual range of temperature of Station B.

(ii) Calculate annual rainfall of Station A.

(iii) Presuming that both the stations are located in West India, state giving a reason as to which of the two lies on the windward side of the Western Ghats.

Ans : SQP 2015

(i) 30.0°C – 2(iv)4°C = 5.6°C.

(ii) Annual rainfall of station A = 0.1 + 0.1 + 0.5 + (i)5 + (ii)7 + 1(i)4 + 16.7 + 9.0 + 1(iii)4 + 9.0 + (ii)7 + 0.3 = 67.4 cm.

(iii) Station B, located on the windward side of the Western Ghats, receives more rainfall than Station A.

207. Study the climatic data given below and answer the question that follow :

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature °C	23.8	25.0	27.7	28.3	30.2	30.3	30.4	30.3	30.0	30.3	25.5	24.2
Rainfall cm	0	0	1.1	1.5	2.1	45.3	46.5	45.4	43.3	20.1	3.0	0.1

(i) Calculate the mean annual temperature.

(ii) What is the total annual rainfall ?

(iii) Presuming that the station is located in India, give a reason for its location being on the east coast or the west coast of India.

Ans : SQP 2013

(i) 2(iii)8 + 25.0 + 27.7 + 28.3 + 30.2 + 30.3 + 30.4 + 30.3 + 30.0 + 30.3 + 25.5 + 2(iv)2 = $= \frac{336}{1} = 28°C$

(ii) 208.4 cm

(iii) West coast. Because the region receives monsoon rainfall.

208. Study the climatic data given below and answer the questions that follow :

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature	24.5	25.7	27.7	20.4	30.0	32.5	31.0	30.2	29.8	28.0	25.9	24.7
Rainfall cm	4.6	1.8	1.3	1.8	3.8	4.5	8.7	11.3	11.9	30.6	35.0	13.9

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(i) Name the driest month.
(ii) Calculate the annual rainfall experienced by the station.
(iii) What is the annual range of temperature ?

Ans : MAIN 2011

(i) The driest month is March with rainfall of only (i)3 cm.
(ii) The annual rainfall is 4.6 + 1.8 + 1.3 + 1.8 + 3.8 + 4.5 + 8.7 + 11.3 + 11.9 + 30.6 + 35.0 + 13.9 = 129.2 cm.
(iii) The Annual Range of Temperature is 3(ii)5 – 20.4 = 1(ii)1°C.

209. Study the climatic data provided below and answer the questions that follow :

Month		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Station A (sea level)	Temp.	24.4	25.4	26.7	29.3	30.0	29.9	29.8	27.8	26.9	26.3	25.1	24.8
	Rainfall (cms.)	0.1	0.1	0.5	0.6	3.8	26.6	29.6	30.5	26.5	11.9	1.1	0.2
Station B (800 m) above sea level	Temp.	8.1	8.9	15.6	20.1	25.2	24.3	24.1	22.7	20.6	18.4	14.1	9.6
	Rainfall	0.4	0.3	0.3	1.1	1.3	3.2	7.7	10.3	5.8	0.7	0.4	0.3

(i) Calculate the annual range of temperature of Station A. Suggest a reason why the range is a small one.
(ii) Which of the two Stations has the lower temperature ? Why ?
(iii) Calculate the annual rainfall of Station B.

Ans : COMP 2008

(i) 5.6. Because the station is near the sea.
(ii) Station B. Because of high altitude.
(iii) Annual rainfall of station B is 3(i)8 cm.

210. Given below is the climate data, mean monthly temperatures and mean monthly rainfall for stations A, B and C from India. Study the data carefully and answer the following questions :

		J	F	M	A	M	Jn	JI	AG	S	O	N	D
Station A	T	24.5	25.7	27.7	20.4	30.0	32.5	31.0	30.2	29.8	28.0	25.9	24.7
	RF	4.6	1.3	1.3	1.8	3.8	4.5	8.7	11.3	11.9	30.6	35.0	13.9
Station B	T	14.4	16.7	23.3	30.0	33.3	33.3	30.0	29.4	28.9	25.6	19.4	15.6
	RF	2.5	1.5	1.3	1.0	1.8	7.4	19.3	17.8	11.9	1.3	0.2	1.0
Station C	T	24.4	24.4	26.7	28.3	30.0	28.9	27.2	27.2	27.2	27.8	27.2	25.0
	RF	0.2	0.2	-	-	1.8	50.6	61.0	36.9	26.9	4.8	1.0	-

J, F, etc. represent months from January to December.
T = Mean monthly temperature in ° Celsius.
RF = Mean monthly rainfall in centimetres.

(i) What is the annual range of temperature in Station A ?
(ii) What is the annual rainfall experienced by the Station A ?
(iii) Name the wettest month in Station A.
(iv) Calculate the annual rainfall of Station C
(v) Name the station with the least annual rainfall.

Ans : SQP 2009

(i) The annual range of temperature in Station A (3(ii)5°C – 2(iv)5°C) = 8°C.
(ii) (iv)6 + (i)3 + (i)(iii)..... =128.7 cm.
(iii) November.
(iv) The annual rainfall of Station C is 18(iii)4 cm. (0.2 + 0.2 + (i)8 + 50.6.....)
(v) The station with the least annual rainfall is Station B.

211. Study the table given below and answer the questions that follow :
(i) Calculate the annual rainfall in station A.
(ii) What is the annual range of temperature in station B ?
(iii) Which of the two stations have an equable climate ?

Station	Month	J	F	M	A	M	J	J	A	S	O	N	D
A	Temp.	14.4	16.7	23.3	30.0	33.3	33.3	30.0	29.4	28.9	25.6	19.4	15.6
	Rainfall	2.5	1.5	1.3	1.0	1.8	7.4	19.3	17.8	11.9	1.3	0.2	1.0
B	Temp.	24.4	24.4	26.7	28.3	30.0	28.9	27.2	27.2	27.2	27.8	27.2	25.0
	Rainfall	0.2	0.2	0.3	1.0	1.8	50.6	61.0	24.8	24.8	24.8	1.0	0.7

Ans : COMP 2015

(i) Annual rainfall in station A is 67.0 cm (2.5 + 1.5 + 1.3 + 1.0 + 1.8 + 7.4 + 19.3 + 17.8 + 11.9 + 1.3 + 0.2 + 1.0)
(ii) Range of temperature in station B is 30°C – 2(iv)4°C = 5.6° C.
(iii) Station B has equable climate.

212. Study the climatic data given below and answer the questions that follow :

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature °C	23.1	24.8	26.5	29.3	32	32.8	33.1	32.1	30.5	29.3	28.7	26.1
Rainfall cm	15.3	10.1	0.3	0.1	1.3	4.5	6.1	10.2	10.5	20.1	16.8	19.1

(i) Calculate the annual rainfall experienced by the station.
(ii) Suggest a name of this station, giving a reason for your answer.
(iii) Name the season during which the rainfall is heaviest.

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Ans : MAIN 2013

(i) Annual rainfall = 15.3 + 10.(i)+ 0.3 + 0.1 + (i)3 + (iv)5 + 6.1 + 10.2 + 10.5 + 20.1 + 16.8 + 19.1 = 11(iv)4

(ii) Chennai (i) Range of temperature is very low.

2. The station is receiving October rainfall.

(iii) Winter.

213. Study the climatic data given below and answer the questions that follow :

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature	23.8	25.0	27.7	28.3	30.2	30.3	30.4	30.3	30.0	30.3	25.5	24.2
Rainfall cm	0	0	1.1	1.5	2.1	45.3	46.5	45.4	43.3	20.1	3.0	0.1

(i) Calculate the mean annual temperature.

(ii) What is the total rainfall during the monsoon season?

(iii) Does the station have a maritime or a continental climate ? Give a reason for your answer.

Ans : COMP 2012

(i) Mean annual temperature = 2(iii)8 + 25 ± 27.7 + 28.3 + 30.2 + 30.3 + 30.4 + 30.3 + 30.0 + 30.3 + 25.5 + 2(iv)2

$$= \frac{336}{13} = 28°C$$

(ii) Monsoon months June to September 45.3 + 46.5 + 45.4 + 4(iii)3 = 180.5 cm

(iii) Range of temperature = Highest temp. - Lowest temp.

30.4 – 23.8 = 6.6°C

Range of temperature is very low which proves that the station has maritime climate.

214. Study the climatic data given below and answer the questions that follow :

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature °C	21.0	21.9	24.3	27.2	28.0	26.4	26.1	25.4	25.0	26.0	23.8	21.2
Rainfall cm	5.1	2.8	1.2	1.7	3.9	4.6	8.4	11.4	11.9	31.6	34.5	14.8

(i) Identify the hottest month.

(ii) Calculate the annual rainfall.

(iii) Name the winds that bring the maximum rainfall to this city.

Ans : COMP 2015

(i) May with temperature of 28°C.

(ii) Annual rainfall 13(i)9.

(iii) North - East trade winds.

215. Study the climatic data of station x given below and answer the questions that follow :

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature °C	24.5	25.7	27.7	28.4	30.0	32.5	31.0	30.2	29.8	28.0	25.9	24.7
Rainfall cm	4.3	1.6	1.7	2.4	2.8	4.6	8.6	11.4	11.8	30.6	35.0	13.9

(i) Calculate the total annual rainfall experienced by the station.

(ii) What is the annual range of temperature ?

(iii) On which coast of India does the station lie ? Give a reason for your answer.

Ans : COMP 2016

(i) 128.7 cm

(ii) Highest - Lowest

32.5°C – 24.5°C = 8°C

(iii) Coromandal Coast : The station is receiving rainfall in the months of October and November.

216. Temperature and rainfall data of stations A & B in India ? Study the given data and answer –

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
A	Temp. (°C)	14.4	16.7	23.3	30.0	33.3	33.3	30.0	29.4	28.9	25.6	19.4	15.6
	Rainfall (cms.)	2.5	1.5	1.3	1.0	1.8	7.4	19.3	17.8	11.9	1.3	0.2	1
B	Temp. (°C)	24.5	25.7	27.7	30.4	33.0	32.5	31.0	30.2	29.8	28.0	25.9	24.7
	Rainfall (cms.)	4.6	1.3	1.3	1.8	3.8	4.5	8.7	11.3	11.9	30.6	35.0	13.9

1. Which is the hottest month of station 'B' ?

2. Which station receives higher rainfall ? Name the month of the lowest rainfall of this station.

Ans : COMP 2020

(i) May - Temp. 33°C.

(ii) Total annual rainfall of station A = 67.0 cms.

Total annual rainfall of station B = 128.7 cms.

Hence, Station B receive higher rainfall.

February and March are the months of lowest rainfall of station B.

217. Study the climate data given below and answer the questions that follow :

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature °C	12.0	25.5	26.3	27.1	30.0	36.2	36.0	35.9	30.3	28.4	21.0	16.6
Rainfall cm	1.5	0.1	0.0	1.4	1.1	21.0	25.3	27.2	24.0	9.4	1.5	0.4

(i) What is the annual range temperature of the station ?

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(ii) What is the total annual rainfall experienced by the station ?
(iii) Why would it be correct to pressure that the station lies in the interior and not on the coast ?

Ans : SQP 2017

(i) 2(iv)2°C
(ii) 11(iii)9 cms
(iii) It is situated in the interior, which results in a high annual temperature range and a continental type of climate, characterized by extremely hot summers and very cold winters.

218. Study the climatic data given below and answer the questions that follow :

Station		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
A	Temp. (°C)	14.4	16.7	23.3	30.0	33.3	33.3	30.0	29.4	28.9	25.6	19.4	15.6
	Rainfall (cms.)	2.5	1.5	1.3	1.0	1.8	7.4	19.3	17.8	11.9	1.3	0.2	1.0
B	Temp. (°C)	24.4	24.4	26.7	28.3	30.0	28.9	27.2	27.2	27.2	27.8	27.2	25.0
	Rainfall (cms.)	0.2	0.2	–	–	1.8	50.6	61.0	24.8	24.8	24.8	1.0	–

(i) Calculate the annual rainfall for station A.
(ii) What is the annual range of temperature of station B ?
(iii) In which hemisphere do you think station A lies ?
(iv) Which of these stations has an equable climate ?

Ans : SQP 2022

(i) The annual rainfall of station A is 67.0 cm.
(ii) Annual range of temperature of station B is 30°C – 2(iv)4°C = 5.6°C.
(iii) Northern Hemisphere.
(iv) Station B.

219. Given below is the climatic data of a station. Study the table and answer the questions that follow:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature (in °C)	13.7	16.6	21.6	25.5	33.2	33.5	30.8	29.8	29.2	25.5	19.6	15.2
Rainfall (in cm)	2.5	2.0	1.5	0.9	1.5	7.5	17.8	18.5	12.5	1.0	0.2	1.5

(i) Calculate the annual range of temperature.
(ii) What is the total rainfall experienced by the station?
(iii) Which is the driest month?

Ans : MAIN 2024

(i) Annual range of temperature: (33.5 – 13.7)°C = 19.8°C.
(ii) 67.4 cm
(iii) November is the driest month.

220. Study the climatic data given below and answer the questions that follow :

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Temp.-°C	23.1	24.8	26.5	29.3	32	32.8	33.1	32.1	30.5	29.3	28.7	26.1
Rainfall cm	15.3	10.1	0.3	0.1	1.3	4.5	6.1	10.2	10.5	20.1	16.8	19.0

(i) Calculate the annual rainfall experienced by the station.
(ii) Suggest a name of this station, giving a reason for your answer.
(iii) Name the season during which the rainfall is heaviest.

Ans : MAIN 2023

(i) The annual rainfall experienced by the station is (15.3 + 10.1 + 0.3 + 0.1 + 1.3 + 4.5 + 6.1 + 10.2 + 10.5 + 20.1 + 16.8 + 19.0) = 114.3 cms.
(ii) The station is called Chennai due to its high rainfall from October to January.
(iii) The winter months experience the highest levels of rainfall.

221. Study the climatic data provided below and answer the questions that follow:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Station A (sea level)												
Temp. (in °C)	24.4	25.4	26.7	29.3	30.0	29.9	29.8	27.8	26.9	26.3	25.1	24.8
Rainfall (in cm)	0.1	0.1	0.5	0.6	3.8	26.6	29.6	30.5	26.5	11.9	1.1	0.2
Station B (800 m above sea level)												
Temp. (in °C)	8.1	8.9	15.6	20.1	25.2	24.3	24.1	22.7	20.6	18.4	14.1	9.6
Rainfall (in cm)	0.4	0.3	0.3	1.1	1.3	3.2	7.7	10.3	5.8	0.7	0.4	0.3

(i) Calculate the annual range of temperature of Station A. Suggest a reason why the range is a small one?
(ii) Which of the two stations has the lower temperature? Why?
(iii) Calculate the annual rainfall of Station B.

Ans : COMP 2008

(i) Station A has an annual temperature range of 5.6 °C, which is affected by its coastal location, the influence of land and sea breezes, and its proximity to the equator.

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(ii) Station B experiences lower temperatures due to its elevation of 800 meters.
(iii) The annual rainfall at Station B measures 3(i)8 cm.

222. Study the table given below and answer the questions that follow :

Station	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
A	Temperature	12.7	15.1	22.1	31.8	37.2	39.1	37.3	33.4	28	26.7	16.1	13.6
	Rainfall	2.1	2.3	1.0	0.9	1.5	5.6	18.3	18.9	15.1	0.6	0.3	1.8
B	Temperature	23.1	24.8	26.5	29.3	32	32.8	33.1	32.1	30.5	29.3	28.7	26.1
	Rainfall	15.3	10.1	0.3	0.1	1.3	4.5	6.1	10.2	10.5	20.1	16.8	19.0

(i) Calculate the annual rainfall in Station A.
(ii) What is the annual range of temperature in Station B?
(iii) Name the winds that bring most of the rainfall to Station B. State one reason for your answer.

Ans : SQP 2017

(i) Annual rainfall in Station A : - 68.4 cm.
(ii) Annual range of temperature in Station B : - 10°C.
(33.1 - 23.1= 10°C)
(iii) The North-East Winter Monsoons provide most of the rainfall to Station B, with the heaviest precipitation occurring between October and February. This suggests that Station B is situated along the east coast of the peninsular region.

223. Given below is the climatic data of a station. Study the table and answer the questions that follow:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature	24.5	25.7	27.7	20.4	30.0	32.5	31.0	30.2	29.8	28.0	25.9	24.7
Rainfall	4.6	1.3	1.3	1.8	3.8	4.5	8.7	11.3	11.9	30.6	35.0	13.9

(i) Calculate the annual rainfall experienced by the station.
(iv) What is the annual range of temperature?
(ii) Name the wettest month.

Ans : COMP 2019

(i) 128.7 cm.
(ii) Highest Temperature :3 (ii)5°C
Lowest Temperature: 20.4°C
Annual Range of Temperature : 1(b)1°C
(iii) Wettest Month : November (35 cm of rain)

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224. Study the climatic data of station x given below and answer the questions that follow:

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature	12.0	25.5	26.3	27.1	30.0	36.2	36.0	35.9	30.3	28.4	21.0	16.6
Rainfall	1.5	0.1	0.0	1.4	1.1	21.0	25.3	27.2	24.0	9.4	1.5	0.4

(i) What is the annual range temperature?
(ii) What is the total annual rainfall experience by the station?
(iii) Why would it be correct to presume that the station lies in the interior and not on the coast?

Ans : MAIN 2009

(i) Annual Range is given by,
= Highest temperature − Minimum temperature
= 36.2 − 12.0
= 24.2 °C
(ii) The total annual rainfall amounts to 11(ii)9 cm.
(iii) It can be inferred that the station is located inland, as indicated by the high temperature range.

III. Map Work

On the outline map of India mark the following :

1. Colour the areas which receive less than 30 cm rainfall in a year.
2. Write L over the region which is the last to receive the South-West Monsoon.
3. Show by arrows, the direction of the rain bearing winds during winter and summer.
4. Mark the wind direction in Ganga basin and Tamil Nadu coast in the month of January.
5. Write E over the region which is the first to receive the South-West Monsoon.
6. Shade an area which receives rain in January and February.
7. Shade and name the regions of India which experience cyclonic rain and conventional rain.
8. Mark dots on the areas which are affected by Loo.
9. Write HAR in an area having high annual range of temperature and LAR in an area having low annual range of temperature.
10. Shade and mark the Thar Desert.
11. Shade in different patterns the three sources of rain in Punjab.

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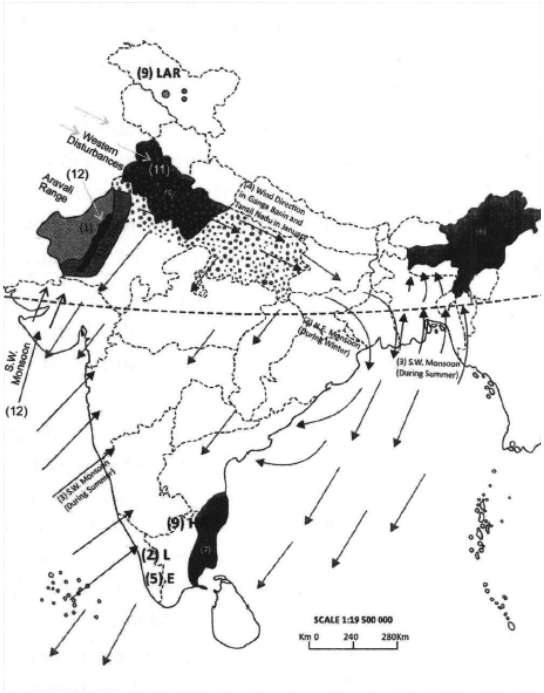
12. Mark and name the mountain range and the direction of rain-bearing winds as a result both of which Rajasthan gets scanty rainfall.

Ans : MAIN 2021



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CHAPTER 5

SOIL RESOURCES

SUMMARY

1. SOIL

Soil is essentially a mixture of small rock particles and organic matter/humus, which forms on the Earth's surface and supports plant growth. Agricultural output is directly linked to soil fertility, as fertile soils enhance productivity and can sustain higher population densities.

2. MAJOR SOILS OF INDIA

The Indian Council of Agricultural Research (ICAR) classifies Indian soils into several major categories:

2.1 Alluvial Soils

This is the most prevalent soil in India, deposited by the Indus, Ganges, and Brahmaputra river systems. Alluvial soil is also referred to as riverine soil.

(i) **Composition :** Alluvial soil consists of silt, sand, and clay, and is rich in nutrients such as humus, potash, phosphoric acid, and lime, which support the cultivation of crops like paddy, wheat, and sugarcane. It is deficient in phosphorus and nitrogen. The soil is typically dark in color with a silty loam or clay texture.

(ii) **Characteristics**

(a) Highly fertile, making it ideal for intensive cultivation and supporting dense populations.

(b) Referred to as transported soil, as it is carried to its current location by rivers.

(c) Coarser particles are found in the upper river reaches, becoming finer downstream.

(d) In arid areas, the soil can be alkaline and productive with proper treatment and irrigation.

(iii) **Types of Alluvial Soils**

(a) **Bhangar :** Older, coarse-textured soil found away from rivers, non-porous, and clayey.

(b) **Khadar :** Newer, fine-textured soil found near rivers, more fertile as new layers are deposited during annual floods.

(iv) **Distribution :** Common in the river valleys of the Northern Plains (Indus, Ganga, Brahmaputra), parts of Gujarat, Rajasthan, and Eastern coastal plains in river deltas of the Peninsular plateau (Mahanadi, Godavari, Krishna, Kaveri). States like Punjab, Haryana, Uttar Pradesh, Bihar, and West Bengal have widespread alluvial soil.

(v) **Crops :** Alluvial soil is ideal for growing rice, wheat, sugarcane, cotton, jute, oilseeds, and pulses, among others.

2.2 Black Soils

Also known as black cotton or regur soil, it forms from the solidification of volcanic lava.

(i) **Characteristics :** Derived from the weathering of igneous rock in the Deccan Plateau, hence called regur soil.

(ii) **Composed of fine clay particles.**

(a) Develops deep cracks during the hot summer, facilitating aeration, but becomes sticky when wet, which can hinder plowing.

(b) Deep black, medium black, or dark brown in color due to its volcanic origin.

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(c) Residual soil, found where it is formed.

(iii) **Distribution :** Found in the Deccan trap (Basalt Lava Region), covering areas in Gujarat, Maharashtra, Madhya Pradesh, Andhra Pradesh, Karnataka, tamil Nadu, and parts of Chhattisgarh, along with the valleys of the Godavari and Krishna rivers.

(iv) **Crops :** Key crops include cotton, sugarcane, groundnut, millets, rice, wheat, oilseeds, and tobacco.

2.3 Red and Yellow Soils

Formed by the weathering of ancient crystalline rocks in regions with low rainfall.

(i) **Composition :** these soils contain iron, potash, and magnesium, with low amounts of humus, phosphorus, lime, nitrogen, and manganese.

(ii) **Characteristics**

(a) Red due to the diffusion of iron particles, appearing yellow when hydrated.

(b) Sandy and less clayey, porous, and slightly acidic, with poor moisture retention.

(c) Soil aggregates (kankars) are absent.

(iii) **Types of Red and Yellow Soils**

(a) **Red Loamy Soils :** Dark red and loamy in texture.

(b) **Red Gravelly Soils :** Dark red with a gravelly texture.

(c) **Mixed Red and Black Soils :** Found in regions where red and black soils merge.

(iv) **Distribution :** Found in low rainfall regions of the Deccan Plateau, including tamil Nadu, Odisha, Madhya Pradesh, Karnataka, Maharashtra, Andhra Pradesh, and the Chotanagpur Plateau in Chhattisgarh and Jharkhand.

(v) **Crops :** Crops include wheat, rice, millet, gram, sugarcane, groundnut, coconut, ragi, oilseeds, pulses, and cotton. Irrigation improves red soil fertility.

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2.4 Laterite or Lateritic Soils

Derived from the Latin word "Later" meaning "brick", these soils form in regions with high temperatures and heavy rainfall, leading to significant leaching.

(i) **Composition :** Rich in iron, phosphate, and aluminium, but lacking in lime, magnesium, phosphoric acid, potash, and humus.

(ii) **Characteristics**

(a) Low in humus due to high temperatures killing microorganisms.

(b) Becomes hard when exposed to air.

(c) Reddish or yellowish-red, turning black upon exposure to sunlight.

(d) Acidic, with poor moisture retention.

(iii) **Distribution :** Found in Karnataka, Kerala, tamil Nadu, Madhya Pradesh, Andhra Pradesh, and hilly areas of Odisha and Assam.

(iv) **Crops :** tea, coffee, cashews, rubber, coconut, rice, sugarcane, and tapioca are commonly cultivated on laterite soils.

3. SOIL EROSION

Soil erosion refers to the removal of the topsoil layer by natural forces such as wind and water, often exacerbated by human activity. It leads to the loss of fertile soil and can result in reduced agricultural productivity, land degradation, and desertification.

Causes of Soil Erosion

(i) Water Erosion : Includes sheet erosion, rill erosion, gully erosion, bank erosion, and shore erosion.

(ii) Wind Erosion : Common in arid and semi-arid regions, where wind moves and deposits soil particles.

(iii) Human Factors : Faulty farming practices, shifting cultivation, overgrazing, and deforestation significantly contribute to soil erosion.

4. SOIL CONSERVATION

Soil conservation is crucial for maintaining agricultural productivity and supporting ecosystems. Key methods include:

(i) **Strip Cropping :** Alternating strips of

crops with grass to reduce wind and water erosion.

(ii) **Contour Plowing :** Plowing along natural contours to slow water flow and encourage absorption.

(iii) **Mulching :** Covering soil with organic material to protect it from erosion and retain moisture.

(iv) **Windbreaks :** Planting rows of trees to reduce wind speed and soil movement.

(v) **terrace Farming :** Building terraces on slopes to slow water runoff and reduce soil erosion.

(vi) **Crop Rotation :** Alternating crops to maintain soil fertility and provide cover.

Other measures include controlled overgrazing, afforestation, and the reclamation of saline and alkaline soils. Flood control is also essential for preventing large-scale soil erosion in vulnerable regions.

MULTIPLE CHOICE QUESTION

1. Which of the following helps in soil conservation?
(a) Afforestation
(b) Overgrazing
(c) Mining
(d) Shifting agriculture

Ans : MAIN 2024

Thus (a) is correct option.

2. Which is the most widespread soil of India?
(a) Red soil
(b) Alluvial soil
(c) Laterite soil
(d) Black soil

Ans : MAIN 2023

Thus (b) is correct option.

3. Name the soil that is found in central Deccan plateau.
(a) Black soil (b) Alluvial soil
(c) Red soil (d) Laterite soil

Ans : SQP 2023

Thus (a) is correct option.

4. How is the soil named by you in Q. 23 above formed?
(a) Formed by the deposition of silt brought down by rivers
(b) Formed by the weathering of laterite rocks.
(c) Formed by the weathering of basic lava rocks
(d) Formed by the weathering of metamorphic rocks

Ans : COMP 2021

Thus (c) is correct option.

5. Why are the foothills of Himalayas prone to excessive soil erosion ?
(a) Absence of crop cover
(b) To much of development of transportation
(c) Large scale deforestation in past
(d) Tourists are spreading pollutants in rivers

Ans : MAIN 2021

Thus (c) is correct option.

6. Name the soil that is generally confined to river basins.
(a) Black soil
(b) Alluvial soil
(c) Red soil
(d) Laterite soil

Ans : MAIN 2021

Thus (b) is correct option.

7. Name the soil that becomes infertile because of desilication.
(a) Black soil
(b) Alluvial soil
(c) Red soil
(d) Laterite soil

Ans : SQP 2021

Thus (d) is correct option.

8. Which of the following constituents add fertility to the soil?
(a) Silica (b) Humus
(c) Clay (d) Sand

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Ans : MAIN 2001

Thus (b) is correct option.

9. Which of the following are the characteristics of fertile soil?
(a) Adequate amount of moisture
(b) Rich in nutrients
(c) Organic matter
(d) All of the above

Ans : COMP 2003

Thus (d) is correct option.

10. Which of the following is a transported or ex situ soil?
(a) Alluvial soil
(b) Laterite soil
(c) Red soil
(d) Black soil.

Ans : SQP 2006

Thus (a) is correct option.

11. Which of the following soils vary from place to place on the basis of the parental rocks and climatic conditions?
(a) Black soil
(b) Laterite soil
(c) Alluvial soil
(d) Red soil

Ans : MAIN 2012

Thus (d) is correct option.

12. Farmers plant trees in several rows to check soil erosion by _____.
(a) Floods
(b) Winds
(c) Drought
(d) Heavy rains

Ans : COMP 2008

Thus (b) is correct option.

13. Alluvial soil is rich in which of the following minerals?
(a) Iron
(b) Nitrogen
(c) Phosphorus
(d) None of the above

Ans : SQP 2010

Thus (a) is correct option.

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14. Red soil gets its name from
(a) Its colour
(b) Its ferric oxide content
(c) Both (a) and (b)
(d) None of the above.

Ans : MAIN 2020

Thus (c) is correct option.

15. Black soil is also known as _____.
(a) Bhangar
(b) Khadar
(c) Regur
(d) Leached

Ans : SQP 2018

Thus (c) is correct option.

16. Laterite soil is mainly found in the highland areas of _____.
(a) The Himalayas
(b) The Peninsular Plateau
(c) The Aravali Range
(d) The Karakoram Range

Ans : MAIN 2016

Thus (b) is correct option.

17. Why is Black soil highly moisture retentive?
(a) It has fifty per cent of clay content
(b) It is formed of weathered lava rocks
(c) It has high quantities of lime and iron
(d) All of the above

Ans : COMP 2020

Thus (a) is correct option.

18. Which of the following is correct about the Laterite soil?
(a) It is the residual soil.
(b) It is formed by leaching due to tropical rains.
(c) Humus content of the soil is removed by bacteria.
(d) All of the above.

Ans : MAIN 2004

Thus (d) is correct option.

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19. Which of the following soils forms the second largest soil group in India?
(a) Black soil
(b) Red soil
(c) Yellow soil
(d) Brown soil

Ans : MAIN 2020

Thus (b) is correct option.

20. Why is the Red soil considered ideal for dry farming?
(a) It is formed in areas with poor rainfall and responds to fertilizers.
(b) It is red in colour.
(c) It is rich in iron oxide.
(d) It is rich in nitrogen.

Ans : SQP 2023

Thus (a) is correct option.

21. The term used for soils found at the place of their formation is:
(a) Ex-situ
(b) In-situ
(c) Transported
(d) Hill soils

Ans : SQP 2018

Thus (a) is correct option.

22. The method of farming in which ploughing is done on alternate strips of land is:
(a) Terrace farming
(b) Transplantation
(c) Broadcasting
(d) Strip cropping

Ans : COMP 2020

Thus (d) is correct option.

23. The type of soil formed by the deposition of silt by rivers is:
(a) Black soil
(b) Red soil
(c) Alluvial soil
(d) Laterite soil

Ans : MAIN 2000

Thus (c) is correct option.

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24. The process of soil formation is:
(a) Denudation
(b) Pedogenesis
(c) Erosion
(d) Weathering

Ans : SQP 2004

Thus (b) is correct option.

25. Which type of soil is moisture retentive but develops cracks when dry?
(a) Alluvial soil
(b) Laterite soil
(c) Black soil
(d) Red soil

Ans : COMP 1999

Thus (c) is correct option.

26. On which type of soil do rubber, cashewnuts, coffee and tapioca grow well?
(a) Black soil
(b) Red soil
(c) Alluvial soil
(d) Laterite soil

Ans : SQP 2005

Thus (d) is correct option.

27. Which agent of erosion is most active in dry regions devoid of vegetation?
(a) Wind
(b) Ice
(c) Canals
(d) Waves

Ans : MAIN 2007

Thus (a) is correct option.

28. The name given to the older alluvium which is clayey and not so fertile is:
(a) Sandy
(b) Bhangar
(c) Khadar
(d) Rocky

Ans : SQP 2016

Thus (b) is correct option.

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29. A type of soil known for its self-ploughing quality is:
(a) Regur soil
(b) Red soil
(c) Black soil
(d) Both (a) and (c)

Ans : COMP 2020

Thus (d) is correct option.

30. Name the type of erosion in mountainous areas which removes vast stretches of land.
(a) Gully erosion
(b) Splash erosion
(c) Sheet erosion
(d) Rill erosion

Ans : MAIN 2016

Thus (c) is correct option.

31. Wind erosion is the most powerful agent of erosion in deserts because of:
(a) Absence of population
(b) Aridity
(c) No vegetation
(d) Both (b) and (c)

Ans : SQP 2019

Thus (d) is correct option.

32. A type of leached soil is:
(a) Red (b) Black
(c) Alluvial (d) Laterite

Ans : COMP 2022

Thus (d) is correct option.

33. What is the main reason for the red colour of red soil?
(a) Abundance of magnesium
(b) Accumulated humus
(c) Presence of ferric oxides
(d) Abundance of phosphates

Ans : COMP 2010

Thus (c) is correct option.

34. To check the speed of wind,_____is done.
(a) Deforestation
(b) Planting of trees
(c) Strip cropping
(d) Both (b) and (c)

Ans : COMP 2008

Thus (d) is correct option.

35. The efforts made by man to prevent the erosion of soil is known as:
(a) Erosion
(b) Deforestation
(c) Conservation of soil
(d) Leaching

Ans : SQP 2010

Thus (c) is correct option.

36. The soil formed by weathering of crystalline rocks is:
(a) Black soil
(b) Red soil
(c) Laterite soil
(d) Alluvial soil

Ans : COMP 2012

Thus (b) is correct option.

37. The type of soil good for the growing of jute and rice is:
(a) Alluvial soil
(b) Laterite soil
(c) Red soil
(d) Black soil

Ans : MAIN 2015

Thus (a) is correct option.

38. Where the soil is fertile, the density of population is:
(a) Low
(b) Medium
(c) Scanty
(d) High

Ans : COMP 2013

Thus (d) is correct option.

39. Clearing of forest cover is often referred to as:
(a) Re-afforestation
(b) Deforestation
(c) Aafforestation
(d) Contour ploughing

Ans : MAIN 2017

Thus (b) is correct option.

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40. The type of soil found on the summits of Eastern and Western Ghats is:
(a) Laterite soil
(b) Alluvial soil
(c) Black soil
(d) Red soil

Ans : SQP 2015

Thus (a) is correct option.

41. The factors responsible for the formation of soil is/are:
(a) Climate
(b) Natural vegetation
(c) Parent material
(d) All of these

Ans : COMP 2019

Thus (d) is correct option.

42. Name the method used to prevent soil erosion by running water.
(a) Terrace farming
(b) Strip cropping
(c) Shelter belts
(d) Leaving the land fallow

Ans : MAIN 2016

Thus (a) is correct option.

43. Name the method used to prevent soil erosion by wind.
(a) Contour ploughing
(b) Strip cropping
(c) Plugging of gullies
(d) Use of fertilizer

Ans : SQP 2011

Thus (b) is correct option.

44. Name the process of removal of soluble mineral salts, especially the bases and silica from horizon A or the top soil by percolating rain water.
(a) Pedogenesis
(b) Leaching
(c) Lithification
(d) Conglomeration

Ans : COMP 2016

Thus (b) is correct option.

45. Which of the following soils is most suitable for the cultivation of cotton and sugarcane?
(a) Laterite soil (b) Black soil
(c) Red soil (d) Alluvial soil

Ans : MAIN 2001

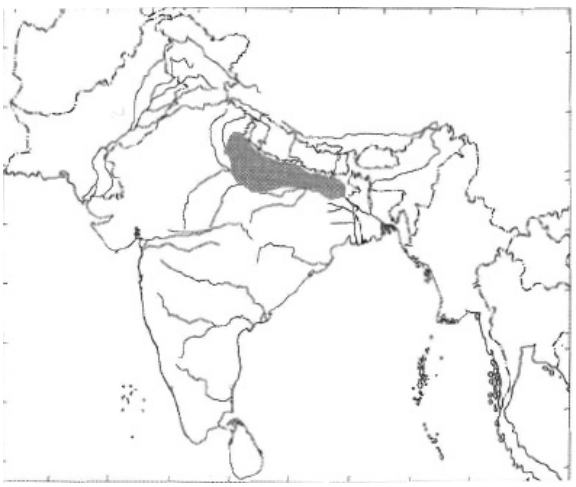
Thus (b) is correct option.

46. Which of the following factors is responsible for acidic nature of laterite soil?
(a) As it is friable in nature.
(b) As it can retain moisture.
(c) As the bases leached down from the top soil.
(d) All the above are correct.

Ans : SQP 2013

Thus (c) is correct option.

47. Study the map and answer the following questions:



(i) Which soil is found in the shaded region?
(a) Black soil (b) Alluvial soil
(c) Red soil (d) Laterite soil

Ans : MAIN 2003

Thus (b) is correct option.

(ii) How is this type of soil formed?
(a) By the deposition of silt brought down by rivers
(b) By weathering of alluvium
(c) Any of these
(d) None of these

Ans : MAIN 2007

Thus (a) is correct option.

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ONE MARK QUESTIONS

48. Mention any two causes of soil erosion in India.

Ans : MAIN 2023

Two major causes of soil erosion in India are:
(i) Deforestation
(ii) Overgrazing

49. Name two soil conservation methods that may be practised in arid (dry) regions.

Ans : MAIN 2023

Planting of shelter belts and Restrictions on overgrazing of animals.

50. Name the state in India which mostly has red soil.

Ans : COMP 2000,2001

Tamil Nadu and Karnataka.

51. Explain the formation of soil.

Ans : COMP 2008,2013

The laterite soil is a result of intense leaching owing to heavy tropical rains.

52. Khadar soils are preferred to Bangar soil.

Ans : SQP 2012

Because it is more fertile

53. What is laterite soil ?

Ans : MAIN 2007

The laterite soils are a result of intense leaching owing to heavy tropical rains.

54. What is the type of soil which is widely distributed over the Ganga Plain ?

Ans : MAIN 1994

The Ganga Plain contains alluvial soils.

55. What is the meaning of leached soil ?

Ans : COMP 2015

A soil from which water soluble substances such as Calcium, potassium, lime etc. are washed away.

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56. Name one Indian soil that has been formed by leaching.

Ans : SQP 1995,2014

Laterite soil is formed by leaching.

57. Different regions in India having different kinds of soil.

Ans : COMP 2014

Due to different relief and climate

58. Give one chemical property of black soil.

Ans : MAIN 2018

Black soil is rich in calcium, carbonate magnesium, potash etc.

59. Name one soil of volcanic origin commonly found in India.

Ans : SQP 2004

The black soils are of volcanic origin.

60. How is the migration of sand dunes from thar desert checked ?

Ans : SQP 2009

By building shelter belts.

61. Name one crop widely grown on this soil.

Ans : MAIN 2010

Cotton grows well on this soil.

62. What is meant by term In Situ ?

Ans : SQP 2019

The soil which are found where they are formed is called "In Situ".

63. Mention one disadvantage of this soil.

Ans : MAIN 2014

One disadvantage of this soil is that it is acidic in nature and not capable of retaining moisture.

64. What is meant by term Regur ?

Ans : COMP 2011

Cotton grows well in black soil so it is also called 'Regur' soil.

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65. What is meant by term Bangar ?

Ans : MAIN 2000

The old clayey alluvial soil which is found in the piedmont plains is called Bangar.

66. What is meant by term Khadar ?

Ans : MAIN 1999

The new alluvial soil that is found is the deltas and flood plains is known as the Khadar.

67. Name two states in which desert soil is found.

Ans : SQP 2018

Desert soil is found in Rajasthan and partially in Punjab.

68. State the two most important factors that determine the types of soils found in India .

Ans : COMP 2020

Climate and parent rock are the two major factors determining the types of soils found in India.

69. Which is the most widely transported soil ?

Ans : MAIN 2002

Alluvial soil is the most widely transported soil.

70. Place in two broad categories the soils of India on the basis of their formation.

Ans : MAIN 2006

The soils of India on the basis of their formation are divided in the following two broad categories :
(i) Residual soil, and
(ii) Transported soil.

71. What are the differences between the alluvial soil found in the upper courses of rivers and that found in the lower courses ?

Ans : SQP 2008

The alluvial soil found in the upper courses of rivers is coarse while the other one which is found in the lower courses is fine.

72. State one feature of mountain soil. Name two crops that can be grown on it.

Ans : COMP 2019

Mountain soil is rich in iron and humus. two crops that can be grown on the mountain soil are-tea and apple plantations.

73. Why is laterite soil unsuitable for agriculture ?

Ans : MAIN 2021

Laterite soil is unsuitable for agriculture because it does not retain moisture.

74. Name two states in which desert soil is found.

Ans : MAIN 2020

Desert soil is found in Rajasthan and partially in Punjab.

75. Which is the most widely transported soil ?

Ans : MAIN 2016

Alluvial soil is the most widely transported soil.

76. What do you understand by laterite soil ?

Ans : SQP 2023

The soil formed due to weathering of lateritic rocks is called laterite soil.

77. What is sheet erosion and how it is counter balanced ?

Ans : COMP 2000

Removal of an entire top layer of soil by water or wind is called sheet erosion. Sheet erosion can be counterbalanced by cultivating a plenty of trees and grasses.

78. How is overgrazing controlled ?

Ans : SQP 2015

Overgrazing is controlled by moving the animals to different pastures in order to prevent the complete removal of vegetation from the pastures.

79. Name one important characteristic of mountain soil.

Ans : SQP 2012

Mountain soil is very rich in humus but deficient in potash, phosphorous and lime.

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80. How is the migration of sand dunes from thar desert been checked ?

Ans : MAIN 2004

The migration of sand dunes from thar desert is been checked by planting shelter belts of series of trees perpendicular to the direction of winds.

81. Explain the following terms :
(i) Gully erosion
(ii) Soil texture
(iii) Contour ploughing
(iv) Slip erosion
(v) Strip cropping

Ans : MAIN 2015

(i) Gully erosion : Gully erosion takes place when running water cuts deep ravines in the absence of vegetation. this type of erosion makes soil unfit for cultivation.
(ii) Soil texture : Soil texture refers to the size of particles in soil. the texture of soil may be gravel, sand, silt or clay.
(iii) Contour ploughing : It is a farming technique which is used in hilly areas to prevent soil erosion. It involves ploughing along the outline of the fields in a circular manner.
(iv) Slip erosion : During heavy rains, water filters into the soil until it is unable to penetrate further by the underlying impervious rocks.
(v) Strip cropping : It is a farming technique in which different kinds of crops are grown in alternate rows instead of leaving strips of land uncultivated.

82. Where is plugging of gullies and ravines practised?

Ans : SQP 2009

Plugging of gullies and ravines is practised in ravines of the Chambel Valley and the portions of Punjab.

83. What type of soil is widely distributed over the Ganga Basin ?

Ans : COMP 2012

Alluvial soil is widely distributed over the Ganga Basin.

84. Name the soil found on the summits of Eastern Ghats.

Ans : COMP 2017

Laterite soil is found on the summits of Eastern Ghats.

TWO MARKS QUESTIONS

85. Mention two characteristics of Black soil.

Ans : MAIN 2023

Two Characteristics of black soil are :
(i) **High moisture retention :** Black soil has a high capacity to retain moisture, making it suitable for dry farming.
(ii) **Rich in minerals :** It is rich in essential minerals like calcium, magnesium, and potassium, which support crop growth, especially for cotton.

86. Why is Black soil found suitable for the production of cotton? (Any two points)

Ans : MAIN 2024

Black soil is suitable for the production of cotton due to following reasons :
(i) **Moisture Retention :** It retains moisture well, helping cotton during dry periods.
(ii) **Nutrient-Rich :** It contains key nutrients like calcium and potassium, essential for cotton growth.

87. Give one difference between each of the following:
(i) Alluvial soil of Uttarakhand and alluvial soil of West Bengal.
(ii) transported soil and residual soil.

Ans : MAIN 2024

(i) Alluvial soil of Uttarakhand is coarser in texture, in West Bengal it is finer in texture.
(ii) Soil which is transported from the place it is formed, ex-situ are transported soil while in-situ soil are residual soil found at the place where it is formed.

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88. What is soil erosion? Which are the two main causes of soil erosion ?

or

Man is largely responsible for soil erosion.

Ans : COMP 2008,2016,2018

Soil erosion is the displacement of soil caused by natural forces, particularly wind and water. However, it primarily occurs due to human activities such as deforestation, excessive cattle grazing, and improper farming practices.

89. State two disadvantages of the red soil.

Ans : MAIN 2000

(i) Red soil is deficient in nitrogen, organic matter, and phosphoric acid, making it less fertile.
(ii) Red soils are porous, they do not retain moisture well.

90. Why is laterite soil unsuitable for agriculture ?

Ans : SQP 2008,2013

Laterite soil develops through intense leaching processes. Upon drying, it hardens to a brick-like state. therefore, it is not suitable for agricultural use.

91. State two main differences between alluvial soil and red soil.

Ans : MAIN 2005

Feature	Alluvial Soil	Red Soil
Soil Origin	transported soil	Residual soil
Moisture Retention	Highly moisture retentive	Not moisture retentive

92. Name the soil which is formed due to high temperature and heavy rainfall with alternating wet and dry periods. Name two states where this type of soil is found.

Ans : SQP 2009

Laterite soil forms through intense leaching in regions that receive heavy rainfall. It is typically found in states like tamil Nadu and Odisha.

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93. State one feature of mountain soil. Name two crops that can be grown on it.

Ans : MAIN 2009

Mountain soil is rich in organic matter due to the decomposition of forest vegetation.tea and coffee can be grown on it

94. State two methods of soil conservation.

Ans : COMP 1999,2006,2016

(i) Planting trees through afforestation helps protect the soil from erosion.
(ii) Building check-dams is a crucial method for controlling soil erosion in the upper sections of rivers.

95. Alluvial soil can hold moisture and is very fertile.

Ans : SQP 2015

Alluvial soil consists of fine particles, making it highly fertile due to its abundance of mineral nutrients like potash and lime.

96. Explain the formation of red soil.

Ans : MAIN 2006

Red soil forms from the weathering of ancient crystalline and metamorphic rocks, especially under hot and dry conditions. Its red color comes from the presence of iron oxide. this soil is typically low in nutrients like nitrogen and phosphorus, making it less fertile.

97. Mention any two advantages of the black soil.

Ans : MAIN 2002

(i) Black soil can effectively retain moisture due to its high clay content.
(ii) During dry periods, it develops deep cracks that enhance aeration and air circulation.

98. (i) Name four major groups of soil found in the Indian plains and plateaus.
(ii) Give two characteristic features of the soil found most suitable for growing cotton and sugarcane in Maharashtra.

Ans : COMP 1996,1997

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(i) Four major groups of soil found in the Indian plains and plateaus are :
(a) Alluvial soil
(b) Regur soils
(c) Red soil
(d) Laterite soil

(ii) (a) High moisture retention : Black soil has the ability to retain moisture for a long time, making it suitable for crops like cotton and sugarcane.
(b) Rich in minerals : It contains essential minerals like calcium carbonate, magnesium, and potash, which promote crop growth.

99. Name the transported soil most widely found in India. State the two sub-categories into which it is generally divided. What are their local names and which one of them is superior to the other ?

Ans : COMP 1996

the transported soil most widely found in India is alluvial soil. the two sub-categories into which it is generally divided are:

(i) **Khadar :** Newer alluvium, found closer to riverbanks, deposited by the river annually.

(ii) **Bhangar :** Older alluvium, found in slightly elevated areas, away from the river.

Khadar is considered superior to Bhangar because it is more fertile, being replenished regularly by fresh silt deposits from rivers.

100. Write any two characteristics of black soil.

Ans : COMP 2015

(i) **High moisture retention :** Black soil has excellent water-holding capacity, which helps crops grow even during dry conditions.

(ii) **Rich in minerals :** It is rich in essential nutrients like calcium, potassium, and magnesium, making it highly fertile and suitable for crops like cotton.

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101. Give a single word for each of the following :
(i) The loose rock material, together with humus, forming the uppermost layer of the earth's crust and serving as a source of food and moisture for plants."
(ii) The process of percolation by which valuable mineral nutrients are washed down from the top layer of the soil to deposit them in the lower layers, making thereby the top soil infertile".

Ans : SQP 1996

(i) Top Soil
(ii) Leaching

102. (i) How was black soil or regur soil formed?
(ii) Where is this soil found in India?

Ans : MAIN 2002,2005,2007,2010

(i) Black soil, also known as regur soil, was formed by the weathering of basaltic rocks, primarily from volcanic lava. this soil is rich in clay and has a high capacity for moisture retention due to its fine texture and high mineral content.

(ii) Black soil is primarily found in the Deccan Plateau region, which includes the states of Maharashtra, Gujarat, Madhya Pradesh, Karnataka, Andhra Pradesh, and tamil Nadu.

103. Name two important agents of erosion. For each state one method of controlling the erosion caused.

Ans : SQP 2010

(i) **Wind :** Afforestation can effectively reduce soil erosion caused by wind.

(ii) **Water :** Constructing dams is a key strategy to control soil erosion resulting from running water.

104. Name any four farming techniques which help in soil conservation.

Ans : SQP 2009,2014

(i) Contour ploughing
(ii) Constructing bunds
(iii) terracing of hills
(iv) Strip cropping.

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105. What are the differences between the alluvial soil found in the upper course of rivers and that found in the lower courses?

Ans : MAIN 2010

Aspect	Upper Course Alluvial Soil	Lower Course Alluvial Soil
Soil particle size and texture	Soil particles are larger, more coarse, and not uniform	Soil particles are fine and less coarse, with abundant silt and clay
Fertility	Less fertile	More fertile.

106. (i) Write any three characteristics of red soil.
(ii) Give one geographical reason for red soil requires irrigation.

Ans : MAIN 2009,2015,2018

(i) Three characteristics of red soil are :
  (a) Reddish color due to the presence of iron oxide.
  (b) Sandy and porous texture, allowing good drainage.
  (c) Low fertility, lacking essential nutrients like nitrogen, phosphorus, and organic matter.

(ii) Red soil requires irrigation because it has poor water retention capacity due to its sandy and porous nature, leading to rapid drying, especially in hot, dry climates.

107. Give a geographical reason for reafforestation should be practiced extensively.

Ans : COMP 2015

(i) **To Prevent Soil Erosion :** the roots of trees and plants stabilize and bind the soil, making it resistant to being washed or blown away by water and wind. Additionally, trees, plants, shrubs, and grasses slow down the flow of water and enhance the soil's ability to absorb moisture.

(ii) **Ecological Balance :** trees are essential for maintaining ecological balance because they absorb carbon dioxide and release oxygen, thereby supporting life and regulating atmospheric gases.

108. Name two important crops associated with the following types of soil :
(i) Alluvial soil
(ii) Black soil
(iii) Desert soil
(iv) Laterite soil

Ans : MAIN 2007,2018

(i) Alluvial soil : Rice, Wheat.
(ii) Black soil : Cotton, Sugarcane.
(iii) Desert soil : Bajra (Pearl Millet), Jowar (Sorghum).
(iv) Laterite soil : tea, Coffee.

109. State two methods of controlling of soil caused by running water.

Ans : MAIN 2012

(i) **Constructing Dams :** Building dams across rivers can significantly reduce soil erosion caused by floods. Dams help to slow down the flow of water, thereby protecting the soil from being washed away.

(ii) **Contour Ploughing :** this method involves ploughing parallel to the natural contours of the land. By following the field's outline, it prevents soil from being carried away by running water.

110. Mention two similarities between red soil and laterite soil.

Ans : MAIN 2016

(i) **Iron content :** Both soils are rich in iron oxide, which gives them a reddish color.

(ii) **Low fertility :** Both red soil and laterite soil are generally low in nutrients like nitrogen, phosphorus, and organic matter, requiring fertilization for improved agricultural use.

111. How is regur soil or black soil formed?

Ans : COMP 2012

Regur soil is formed in situ, meaning it develops in the location where it is found. It originates from the weathering of the Deccan trap basalt rock.

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112. (i) Name the Indian soil which is formed due to the weathering of basic igneous rocks.
(ii) Name two states of India where this type of soil is found.

Ans : SQP 2019

(i) The Indian soil formed due to the weathering of basic igneous rocks is black soil (also known as regur soil).
(ii) Two states of India where black soil is found are Maharashtra and Gujarat.

113. Name an area in India in which each of the following processes take place:
(i) Sheet erosion
(ii) Gully erosion

Ans : MAIN 2017

(i) Sheet Erosion : Common in the floodplains of the Ganga, Brahmaputra, and Damodar rivers, as well as the Himalayan slopes, northeastern slopes, and hill regions that receive heavy rainfall.
(ii) Gully Erosion : Occurs in areas such as the Chambal Valley, and along the Sabarmati and Mahi rivers.

114. How is red soil formed? State two reasons for the low productivity of red soil.

Ans : COMP 2021

Red soil is formed by the weathering of ancient crystalline and metamorphic rocks, particularly under hot, dry climatic conditions. the soil gets its red color from the presence of iron oxide.
two reasons for the low productivity of red soil are :
(i) **Nutrient deficiency :** Red soil is poor in essential nutrients like nitrogen, phosphorus, and organic matter, which are vital for plant growth.
(ii) **Low moisture retention :** Due to its porous and sandy nature, red soil does not retain water well, making it less suitable for moisture-dependent crops.

115. How is alluvial soil formed? Why is this soil agriculturally important?

Ans : SQP 2024

Alluvial soil forms from the deposition of silt carried by rivers from the mountains. It is agriculturally significant due to its softness, fertility, and richness in humus and lime.

116. Name an area of black soil in India. Mention two crops grown in this soil.

Ans : MAIN 2018

An area of black soil in India is the Deccan Plateau, which includes states like Maharashtra and Gujarat.
two crops grown in black soil are:
(i) Cotton
(ii) Sugarcane

117. Mention any two advantages of the alluvial soil.

Ans : MAIN 2004

(i) It is light and porous, making it easy to till.
(ii) It supports the cultivation of a wide range of both rabi and kharif crops.

118. What is soil conservation? State a method of soil conservation in the :
(i) Arid and Semi-Arid region.
(ii) River valleys prone to flood.

Ans : SQP 2017

Soil Conservation involves human efforts to prevent soil erosion and maintain its fertility.
Methods of Conservation :
(i) In Arid and Semi-Arid Regions:
  (a) Planting shelter belts
  (b) Afforestation and reforestation
(ii) In Flood-Prone River Valleys:
  (a) Constructing dams and barrages
  (b) Building check dams
  (c) Afforestation and reforestation

119. Name the following :
(i) An important transported soil of India.
(ii) Soil that is rich in iron oxide.

Ans : COMP 2009

(i) **Alluvial soil :** An important transported soil of India.
(ii) **Red soil :** Soil that is rich in iron oxide.

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120. What is the soil ? Name the four types of soil.

Ans : MAIN 2023

Soil is a thin, loose layer made up of small rock particles and decomposed organic material that covers the Earth's surface. It supports forests, grasslands, and crops, which provide the essential energy sources for all living organisms on the planet.the four main types of soil found in India are:

(i) Alluvial soil
(ii) Black soil
(iii) Red soil
(iv) Laterite soil

121. State two main differences between Alluvial soil and Red soil.

Ans : COMP 2005,2014

Aspect	Alluvial Soil	Red Soil
Fertility	Alluvial soil is highly fertile because it contains abundant mineral nutrients such as potash and lime.	It is less fertile due to its deficiency in phosphorus, nitrogen, lime, and humus.
Formation	Most alluvial soil originates from sediments deposited by rivers.	Red soil primarily forms from the weathering of ancient crystalline and metamorphic rocks.

122. Write any two characteristics of red soil.

Ans : SQP 2020

The characteristics of red soil are as follows:

(i) The soil is typically red in color, but can also range from brown to chocolate or yellow.
(ii) It lacks phosphoric acid, organic matter, and nitrogen, but is relatively rich in potash.

123. Name a part of India where (i) wind is the main agent of erosion, and (ii) water is the main agent of erosion.

Ans : MAIN 2014

(i) A part of India where wind is the main agent of erosion is the thar Desert in Rajasthan.
(ii) A part of India where water is the main agent of erosion is the Chambal Valley in Madhya Pradesh.

124. State any two factors responsible for the formation of soil.

Ans : SQP 2015

(i) Various natural forces such as changing temperature, running water, and wind play a key role in the formation of soil.
(ii) Along with these forces, chemical and organic changes contribute to the soil's evolution, a process that has taken millions of years.

125. How are alluvial soil formed ?

Ans : MAIN 2022

Alluvial soil is composed of fine silt from higher altitudes, transported and deposited by rivers and their tributaries.

126. What are the characteristics of alluvial soil ?

Ans : MAIN 2024

(i) Alluvial soil is formed by the deposition of river load as the river moves from its upper to lower course. It is predominantly found in piedmont plains and can be up to 500 meters deep.
(ii) The soil in the upper river valleys is coarse with large and non-uniform particles, while the lower areas have finer soil. It is light, porous, and easy to till.
(iii) Alluvial soil is fertile, rich in minerals like potash and lime, but generally deficient in nitrogen and humus, except in the Ganga delta, where it is rich in humus.
(iv) It supports a wide variety of rabi and kharif crops, though soils in drier areas tend to be more alkaline.

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127. Name the soil known for its self-ploughing quality and the capacity to hold moisture. Name two cash crops for which it is specially suited.

Ans : MAIN 2001

The soil known for its self-ploughing quality and capacity to hold moisture is black soil (also known as regur soil).
two cash crops for which it is specially suited are cotton and sugarcane.

128. Name one soil of volcanic origin commonly found in India. Name one crop widely grown on this soil.

Ans : COMP 2023

Black soil, a soil of volcanic origin commonly found in India, is widely used for growing cotton.

129. Why is laterite soil unsuitable for the cultivation of crops? Name an area in India where this soil is found.

Ans : SQP 2008

Laterite soil is unsuitable for crop cultivation because it is highly acidic and deficient in essential nutrients like nitrogen, phosphorus, and potassium. Additionally, its coarse and porous texture leads to poor water retention, making it less ideal for most crops without proper soil management and fertilization.
Laterite soil is found in the highland areas of the Deccan plateau, e.g., summits of the Eastern and Western Ghats.

130. What is meant by the following terms :
(i) In Situ
(ii) Regur
(iii) Bangar

Ans : SQP 2006

(i) In Situ : the soil that is found exactly where it is formed is called "In Situ" soil.
(ii) Regur : Cotton grows well in black soil, which is why it is also called "Regur" soil.
(iii) Bangar : the older, clayey alluvial soil found in the piedmont plains is referred to as "Bangar".

131. Why are red soils not suitable for agriculture ?

Ans : COMP 2003

Red soils are not ideal for agriculture because they lack essential nutrients and have poor water retention. However, they can be improved with irrigation and fertilization.

132. Why are alluvial soils very fertile ?

Ans : SQP 2002

Alluvial soils are highly fertile due to their richness in minerals, particularly potash and lime. they are light, porous, and easily tillable, making them ideal for agriculture.

133. (i) Why is soil a valuable resource for India ?
(ii) Why is black soil considered a productive soil ?

Ans : COMP 2005

(i) Soil is a crucial resource as it indirectly supplies nutrients to all organisms within the ecosystem. It serves as a medium for plant growth, offering essential nutrients and water. Since plants form the primary food source for the rest of the ecosystem, without soil, plant growth would be impossible, and other organisms would not survive.
(ii) Black soil is considered as productive soil and it is suitable for the growth of cotton because it is rich in iron, potash, calcium, magnesium, etc. It can retain moisture for long duration.

134. Give two characteristics features of the soil found most suitable for growing cotton and sugarcane in Maharashtra.

Ans : SQP 2004

(i) High moisture retention : Black soil has excellent water-holding capacity, which helps crops like cotton and sugarcane grow even during dry conditions.
(ii) Rich in minerals : It contains essential nutrients like calcium, potassium, and magnesium, which are vital for the healthy growth of cotton and sugarcane.

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135. (i) Name the process by which Laterite soil is formed.
(ii) Mention one disadvantage of Laterite soil ?

Ans : SQP 2019

(i) Laterite soil is formed through the process of intense leaching due to heavy rainfall and high temperatures, which wash away soluble minerals and nutrients from the soil.
(ii) One disadvantage of laterite soil is its low fertility, as it is deficient in essential nutrients like nitrogen, phosphorus, and potassium.

136. State the two sub-categories into which alluvial soil is generally divided. Which one of them is superior to the other ? Why ?

Ans : MAIN 2021

Alluvial soil is divided into two sub-categories:
(i) Khadar : Newer, fertile soil found in river floodplains, replenished by silt from floods.
(ii) Bhangar : Older, less fertile soil found in upland areas with coarse particles and lime nodules.
Khadar is superior due to its higher fertility and regular renewal by floods.

137. Name the main components of soil.

Ans : COMP 2010

The main components of soil are:
(i) Mineral Particles : these include sand, silt, and clay, which provide structure and texture to the soil.
(ii) Organic Matter : Composed of decomposed plant and animal materials, organic matter improves soil fertility and structure.
(iii) Water : Essential for plant growth, water in the soil helps dissolve nutrients, making them accessible to plants.
(iv) Air : Pores in the soil hold air, which provides oxygen to roots and soil organisms.
(v) Microorganisms : these include bacteria, fungi, and other organisms that break down organic matter and help recycle nutrients.

138. Name the factors responsible for soil formation.

Ans : MAIN 2007

The factors responsible for soil formation are:
(i) Parent Material : the rock or material from which soil forms.
(ii) Climate : temperature and rainfall influence weathering and soil formation.
(iii) Topography : Land shape affects drainage and erosion.
(iv) Biological Factors : Plants, animals, and microorganisms contribute organic matter.
(v) Time : Soil forms gradually over long periods.

139. What is leaching ? Give an example of a leached soil.

Ans : MAIN 2004

Leaching is the process in which water percolates through the soil, washing away nutrients and minerals from the upper layers to the lower layers. this often results in nutrient depletion in the topsoil.
An example of leached soil is laterite soil, which forms in regions with heavy rainfall, where minerals like iron and aluminum remain, but essential nutrients get washed away.

140. Name the type of soil which is :
(i) Useful for the cultivation of jute.
(ii) Formed by decomposition of smetamorphic rocks.
(iii) Covers 40% of land area of India.
(iv) Develops on old crystalline rocks under moderate to heavy rainfall.

Ans : SQP 2005

(i) Alluvial soil
(ii) Red soil
(iii) Alluvial soil
(iv) Red soil

141. Name the major soils of India.

Ans : MAIN 2001

The major soils of India are:
1. Alluvial Soil

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2. Black Soil (Regur)
3. Red Soil
4. Laterite Soil
5. Desert Soil
6. Mountain Soil
7. Peaty and Marshy Soil

THREE MARKS QUESTIONS

142. With reference to Laterite soil, answer the questions that follow:
(i) How is Laterite soil formed?
(ii) How can Laterite soil be made productive?
(iii) Name one region where Laterite soil is found.

Ans : MAIN 2024

(i) Laterite soil is formed through intense leaching in areas with heavy rainfall and high temperatures, which causes the removal of silica and the accumulation of iron and aluminum oxides.
(ii) Laterite soil can be made productive by adding fertilizers and organic manure, and practicing proper irrigation techniques to enhance its fertility.
(iii) Laterite soil is found in tamil Nadu.

143. (i) Mention two causes of soil erosion in India.
(ii) Mention a soil conservation method suitable for hilly area.

Ans : MAIN 2024

(i) Two causes of soil erosion in india are:
(a) Deforestation : the removal of trees reduces the protective cover, making soil more prone to erosion by wind and water.
(b) Overgrazing : Excessive grazing by animals leads to the removal of vegetation cover, exposing soil to erosion.
(ii) A soil conservation method suitable for hilly areas is terrace farming. this method involves creating step-like terraces on slopes, which reduce water runoff and help in conserving soil.

144. Name the soil :
(i) That is found on the summits of Eastern and Western Ghats.
(ii) That is suitable for dry farming.
(iii) That varies in texture.

Ans : MAIN 2023

(i) Laterite soil : Found on the summits of the Eastern and Western Ghats.
(ii) Red soil : Suitable for dry farming due to its moisture-retentive properties.
(iii) Alluvial soil : Varies in texture, ranging from sandy loam to clay.

145. Give a geographical reason for each of the following:
(i) Terrace farming is an ideal soil conservation method for hilly areas.
(ii) Khadar soils are preferred over Bhangar soils.
(iii) Foothills of Himalayas have been affected by soil erosion

Ans : MAIN 2023

(i) Terrace farming is an ideal soil conservation method for hilly areas because it helps reduce the speed of water runoff and prevents soil erosion by creating flat steps on the slopes, allowing water to be absorbed.
(ii) Khadar soils are preferred over Bhangar soils because Khadar soils are newer alluvial soils, more fertile, and replenished regularly by floodwaters, whereas Bhangar soils are older, less fertile, and contain more coarse materials.
(iii) Foothills of the Himalayas have been affected by soil erosion due to heavy rainfall, deforestation, and overgrazing, which loosen the soil and allow it to be easily washed away by rainwater and rivers.

146. (i) Which soil is found suitable for coffee cultivation in Karnataka ?
(ii) Name the type of soil found on the summit of the Eastern Ghats.
(iii) Name the soil known for its self ploughing quality and capacity to hold moisture. Name one cash crop for which it is most suited.

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Ans : SQP 2001

(i) The soil suitable for coffee cultivation in Karnataka is laterite soil.
(ii) The type of soil found on the summit of the Eastern Ghats is Red soil.
(iii) The soil known for its self-ploughing quality and capacity to hold moisture is black soil.

147. Explain the formation of alluvial soil.

Ans : COMP 2007

Alluvial soil is composed of very fine particles called silt, which are transported and deposited by rivers. As rivers enter their lower courses, they slow down due to a gentle slope or gradient. this reduced velocity makes the river flow sluggish, leading to the formation of islands made of silt and mud within the channel. this process repeats multiple times, eventually creating a typical delta.

148. (i) Mention two ways by which soil can get nitrogen.
(ii) Explain the need for soil conservation in India. State two methods of soil conservation.

Ans : MAIN 2006,2014,2015

(i) Ways to Increase Nitrogen in Soil :
  (a) Growing Pulses : Certain bacteria present in the roots of pulse plants have the ability to fix atmospheric nitrogen, converting it into nitrogen compounds that enrich the soil.
  (b) Applying NPK Fertilizers : the use of NPK (Nitrogen, Phosphorus, Potassium) fertilizers adds essential nutrients, including nitrogen, to the soil, enhancing its fertility.
(ii) Importance of Soil :
  (a) Vital Resource for India : Soil is India's most valuable asset, with over 60% of the population depending on agriculture for their livelihood.
  (b) Foundation for Development : Healthy soil is crucial for the advancement of agriculture, forests, and industrial growth, ensuring overall progress and sustainability.

149. (i) How does industry cause land degradation ?
(ii) What is conservation of soil ?

Ans : SQP 2009

(i) (a) Industrial Pollution : Mineral processing industries emit numerous harmful gases and chemicals, which adversely impact soil fertility.
  (b) Waste Disposal : the dumping of factory waste and chemical residues on land contributes to the degradation of the soil.
(ii) Soil conservation encompasses a range of techniques and methods aimed at preventing soil degradation and preserving soil health.

150. Write three characteristics each of 'Khadar' and 'Bangar' soil.

Ans : COMP 2008,2012,2013

(i) Khadar Soil :
  (a) Newer deposits from rivers, making it highly fertile.
  (b) Finer particles, mainly silt and clay.
  (c) Regularly replenished, ideal for crops like wheat and rice.
(ii) Bhangar Soil :
  (a) Older, higher deposits, less fertile.
  (b) Coarser texture with larger particles.
  (c) Contains kankar (calcareous nodules), reducing fertility.

151. (i) Name the soil which supports half of the population of India.
(ii) Why is laterite soil found in the Western Coastal regions ?
(iii) Name the soil which has the maximum capacity to hold moisture.
(iv) Why red soil is red in colour ?

Ans : COMP 2008,2012

(i) The soil that supports half of the population of India is alluvial soil.
(ii) Laterite soil is found in the Western Coastal regions due to the heavy rainfall, high temperature, and alternating wet and dry conditions that lead to intense leaching and the formation of laterite.

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(iii) The soil with the maximum capacity to hold moisture is black soil .
(iv) Red soil is red in color due to the presence of iron oxide in the soil, which gives it a reddish hue.

152. Differentiate between transported soil and In Situ soil, quoting a suitable example of each.

Ans : MAIN 2013

Transported Soil	In Situ Soil
Transported soil is very fertile as it is rich in mineral nutrients like potash and lime.	It is less fertile as it is deficient in phosphorus, nitrogen, lime and humus.
Transported soil is derived from the sediments deposited by rivers.	In situ soils are formed due to weathering of ancient crystalline and metamorphic rocks.
It is found in river valleys.	It is found in Deccan trap.

153. Give a geographical reason for each of the following :
(i) The colour of alluvium soil varies in different areas.
(ii) Khadar is more fertile than bhangar soil.
(iii) Black soil has a kind of self-ploughing characteristic.

Ans : COMP 2006

(i) The colour of alluvial soil varies due to factors such as the depth at which it is deposited, the texture of the material carried by the river, and the time taken for the soil to mature. these variations influence the soil's appearance in different regions.
(ii) Khadar is more fertile than Bhangar soil because it receives fresh layers of nutrient-rich silt deposited annually during the monsoon floods, which continuously rejuvenates its fertility.
(iii) During the dry season, black soil shrinks and develops large cracks, which facilitate air circulation within the soil. this natural process, often referred to as 'self-ploughing,' improves soil aeration and helps in soil regeneration without manual intervention.

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154. How does the Ganga Yamuna plain differ from that of Central Maharashtra ?

or

Mention two differences between Alluvial Soil and Black Cotton Soil.

Ans : MAIN 2009,2018,2017

Ganga Yamuna plain has alluvial soil whereas central Maharashtra has black soil

Alluvial Soil	Black Soil
Alluvial soil is a transported soil.	It is an insitu soil (residual soil).
these soil is made up of fine silt brought down by the rivers and their tributaries.	these soil has been formed due to the withering of the lava.
they occupy the extensive tracts of West Punjab, U.P., Bihar, West Bengal, part of Assam, Odisha and the coastal strips of Peninsular India. they also occupy a part of Gujarat and Rajasthan.	these soils are mainly found in Maharashtra, Western Madhya Pradesh, parts of Karnataka, Andhra Pradesh, Gujarat and tamil Nadu.
Wheat, sugarcane, jute etc. are important crops grown.	Cotton, wheat, tobacco are important crops grown.

155. Give a geographical reason for each of the following :
(i) Terrace farming is an ideal soil conservation method for hilly regions.
(ii) Dry faming is preferred in areas with red soil.
(iii) Wind is a common agent of soil erosion in arid regions.

Ans : SQP 2019

(i) It slows down the downward flow of water across the soil surface, thereby minimizing the movement of soil with the water flow. Additionally, it allows water to infiltrate into the soil.

(ii) Because it requires only a minimal amount of moisture.

(iii) In regions with low rainfall, wind can lift valuable topsoil from one area and deposit it in another, making wind a common agent of soil movement.

156. With reference to Red soils in India, answer the following questions :

(i) Name two states where it is found.

(ii) State two advantages of this type of soil.

(iii) Mention two important crops grown in this soil.

Ans : SQP 2013

(i) Tamil Nadu and Karnataka

(ii) Two advantages of red soil are :

(a) Red soil is utilized for cultivating wheat and rice.

(b) the soils have a loamy texture.

(iii) Wheat and rice.

157. Give a geographical reason for each of the following :

(i) Alluvial soil differs in texture.

(ii) Black soil does get leached.

(iii) Khaddar is more fertile than bhangar.

Ans : MAIN 2016

(i) This is because it is a transported soil. In the upper course of the river, the soil is coarse, whereas in the lower course, it becomes fine-grained.

(ii) Because it becomes sticky after rainfall.

(iii) Khaddar soils are more prevalent as they are located in the low-lying areas of valley bottoms, which experience flooding almost every year.

158. (i) How can you say that soil has evolved over millions of years ?

(ii) Name one important constituent of soil that adds fertility to the soil.

Ans : MAIN 2007

(i) Changing temperature, running water and wind affect formation of soil. these forces of nature along with the chemical and organic changes that take place in the soil contribute to the evolution of soil. thus soil itself, has evolved over millions of years.

(ii) Decomposed vegetal and animal remains, called humus, is an important constituent of soil and adds to the fertility of the soil.

159. Give a geographical reason for each of the following :

(i) Different regions in India have different kinds of soil for agriculture.

(ii) Alluvial soils vary in texture.

(iii) Nearly all types of crops grow well in riverine soils.

Ans : SQP 2008

(i) Different regions in India have diverse types of soil due to the varying characteristics of rocks, relief, vegetation, and climatic conditions across the country.

(ii) Alluvial soil varies in texture because it is formed by the deposition of river sediments. In the upper reaches of a river, the soil is coarse and dry, while in the lower reaches, the deposited alluvial soil is finer and more moist.

(iii) Riverine soil is highly fertile, rich in essential minerals such as potash and lime, which makes it suitable for growing a wide variety of crops.

160. Give a geographical reason for each of the following :

(i) Deltaic alluvium is more fertile than the coastal alluvium.

(ii) Black soil is largely found in the Deccan trap region.

(iii) Black soil is often referred to as Cotton soil or Regur soil.

Ans : COMP 2010

(i) Coastal alluvium, being mixed with and, has a lower water retention capacity compared to its deltaic counterparts. Deltaic alluvium, enriched by freshly

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deposited alluvial material from rivers, is much more fertile and retains moisture better.

(ii) Black soil, also known as regur soil, is derived from the weathering of basalt rock, which is prevalent in the Deccan trap region of India. this region consists of volcanic lava flows, which have weathered over time to form the characteristic black soil.

(iii) This soil, known as Regur soil or Black Cotton Soil, is black in color and ideal for cotton cultivation. It is a residual soil, meaning it forms in place from the weathering of the underlying rocks at its site of origin.

161. Name any two farming techniques which help in soil conservation.

Ans : MAIN 2010

Ttwo farming techniques that aid in soil conservation are crop rotation and contour ploughing.

(i) Crop Rotation : this method involves cultivating different crops in a regular cycle on the same land to maintain soil fertility and productivity.

(ii) Contour Ploughing : Commonly practiced in hilly regions, this technique involves ploughing along the natural contours of the land in a circular pattern to prevent soil erosion from running water.

162. Give a geographical term for the following :

(i) Erosion of top soil by natural agencies.

(ii) Washing down of soluble salts from top layer to lower layers.

(iii) Finger-shaped grooves developing due to silt laden run off.

Ans : SQP 2013

(i) The erosion of topsoil by natural forces is referred to as sheet erosion.

(ii) The process of soluble salts being washed down from the top layer to the lower layers is known as gully erosion.

(iii) Finger-shaped grooves formed by silt-laden runoff are called rill erosion.

163. Give a geographical reason for each of the following :

(i) Laterite soil is useful for construction purpose.

(ii) Soils of the Western Ghats are affected by wind erosion.

(iii) The foothills of the Himalayas are prone to excessive soil erosion.

Ans : SQP 2011

(i) Laterite soils are commonly used as building materials because they harden like iron when exposed to air. they have a red color due to the presence of iron oxide and are generally coarse, friable, and porous. While rich in iron, they are deficient in lime, magnesium, phosphoric acid, and potash. these characteristics make laterite soil particularly valuable for construction purposes.

(ii) The soils of the Western Ghats are impacted by wind erosion as sand from the thar Desert in Rajasthan is blown by winds into the fertile western Gangetic plains during the early summer months.

(iii) Excessive soil erosion in the foothills of the Himalayas is primarily caused by deforestation, frequent floods, and uncontrolled grazing by livestock.

164. Name the type of soils which is :

(i) Formed due to volcanic activity

(ii) Formed as a result of leaching

(iii) Formed by the decomposition of metamorphic rocks.

(iv) Agriculturally most important

(v) Useful for the cultivation of jute

Ans : COMP 2011

(i) Black Soil : Formed due to volcanic activity.

(ii) Laterite Soil : Formed as a result of leaching.

(iii) Red Soil : Formed by the decomposition of metamorphic rocks.

(iv) Alluvial Soil : Agriculturally most important.

(v) Marshy Soil : Useful for the cultivation of jute.

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165. (i) Explain the formation of Laterite soil. Why is Laterite soil not suitable for cultivation ?
(ii) Give one difference between the following :
(a) Khadar soil and Bhangar soil.
(b) Sheet erosion and Wind erosion.

Ans : COMP 2014

(i) Laterite soil is formed through the weathering of lateritic rocks as a result of intense leaching. It is unsuitable for cultivation because it lacks moisture retention and is acidic in nature.

(ii) (a)

Criteria	Khadar Soil	Bhangar Soil
type	Newer alluvial soil found in floodplains	Older alluvial soil found in upland areas
Fertility	More fertile due to regular deposition of silt	Less fertile, contains lime nodules (kankar)

(b)

Criteria	Sheet Erosion	Wind Erosion
Cause	Removal of topsoil by water over a large area	Removal of soil particles by wind in dry areas
Common in	Humid and sloping regions	Arid and semi-arid regions

166. Account for the following :
(i) Black soil needs to be tilled after the first rains.
(ii) Red soil is ideal for the dry farming.
(iii) Red colour of red soil.
(iv) Black colour of regur soil.
(v) Differences in the soils of north-west Uttar Pradesh and those of West Bengals.

Ans : MAIN 2012

(i) Black soil needs to be tilled after the first rains because it becomes sticky when it comes into contact with rainwater.
(ii) Red soil is ideal for dry farming as it retains little moisture, making it suitable for farming practices that do not require much water.
(iii) The red color of red soil is due to the presence of iron compounds.
(iv) The black color of regur soil is attributed to its fine iron content, derived from volcanic lava materials.
(v) The soil in north-west Uttar Pradesh, known as Bhangar alluvial soil, is clayey, found in the piedmont plains, and coarser in texture, often containing lime nodules. In contrast, the soils of West Bengal are classified as Khadar alluvial soil, found in the floodplains and deltas, making them more fertile due to regular replenishment by river silt.

167. Which two types of soil are the most important? Where are they found and what are their characteristics ? Which crops are associated with them ?

Ans : MAIN 2015

The two most important types of soil are:
(i) **Alluvial Soil :** Found in the vast plains of the Indus and Ganga-Brahmaputra rivers, including regions like Punjab, Haryana, Uttar Pradesh, Bihar, and West Bengal. Deltaic alluvium is present in the deltas of the Ganga-Brahmaputra, Godavari, Mahanadi, and Kaveri rivers, while coastal alluvium is found along the coastal areas of Peninsular India. Rice and wheat are the primary crops cultivated in alluvial soil.
(ii) Black Soil : Predominantly located in the Deccan region, which includes large parts of Maharashtra, Gujarat, and portions of tamil Nadu, Andhra Pradesh, and Madhya Pradesh. Cotton is the main crop grown in black soil, making it ideal for cotton farming.

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168. Which is the most extensive soil ? How is it formed and what does it represent ?

Ans : SQP 2016

Alluvial soils are the most widespread in India, covering a large part of the country. these include inland alluvium, deltaic alluvium, and coastal alluvium. Inland alluvium stretches across the Ganga-Brahmaputra plains, covering regions like West Punjab, Uttar Pradesh, West Bengal, Bihar, Odisha, and parts of Assam. Coastal alluvium is found along the western and eastern coasts of Peninsular India, while deltaic alluvium is located in areas like West Bengal and Odisha, particularly in the southern plains of river estuaries. Alluvial soil is formed by the deposition of sediments brought down by rivers from their upper courses.

169. What is soil conservation ? State two ways in which one can reduce soil erosion.

or

Soil conservation is an effort made by man to prevent soil erosion to retain the fertility of soil.

Ans : SQP 2019

Three important methods of soil conservation are :

(i) Afforestation : tree and plant roots firmly anchor the soil, preventing it from being easily eroded by wind and water. Additionally, trees and plants slow down the speed of running water and blowing wind, reducing soil erosion.

(ii) Proper Farming techniques : Implementing terracing on hill slopes helps effectively control soil erosion. Other practices such as strip cropping and building bunds across hill slopes and field boundaries also reduce soil erosion in hilly areas.

(iii) Restricted Grazing of Animals : Rotational grazing should be practiced, where animals are moved between different grazing pastures to prevent the complete removal of vegetation from any single area, thereby reducing soil degradation.

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170. What is being done to tackle the 150 million hectares of land which are presently affected by soil erosion ?

Ans : COMP 2017

Farmers are receiving both technical and financial assistance to address the 150 million hectares of land currently impacted by soil erosion. the government has launched several initiatives, including the Drought Prone Area Programme (DPAP), rural development programmes, dryland development through an extensive irrigation network, agro-forestry, watershed management, and the protection of fragile mountain ecosystems. these efforts aim to promote sustainable land use and reduce soil degradation.

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171. (i) How are soils formed ?
(ii) Name the main components of soil.

Ans : COMP 2020

(i) Soils are formed from parent material through processes of weathering, including breakdown and wear over time. the formation of soil is influenced by factors such as relief, climate, and vegetation, while animals, insects, and human activity also contribute significantly. Soil forms under specific natural conditions and is a mixture of minerals and inorganic matter resulting from the denudation and disintegration of rocks. though soil is considered a renewable resource, it takes a long time to regenerate. the process of soil formation is called pedogenesis.

(ii) Soil is composed of both inorganic and organic materials.

(a) Inorganic Components : these include silica, clay, and chalk (calcium carbonate), which form the primary structure of the soil.

(b) Organic Components : the key organic matter is humus, which forms from the decomposition of plant remains, animal waste, and dead organisms.

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Ans : MAIN 2012

Thus (d) is correct option.

19. Why do tidal forests have a profuse growth with tangle of climbers?
(a) To adapt themselves to survive in soft and shifting mud in wet marshy areas and river deltas.
(b) To breathe while being submerged under water through pores.
(c) To adapt themselves to live in damp and moist conditions.
(d) None of the above

Ans : SQP 2014

Thus (b) is correct option.

20. Littoral forests have breathing roots called
(a) Pneumatophores
(b) Pinophores
(c) Phytopores
(d) None of the above.

Ans : COMP 2020

Thus (a) is correct option.

21. For which purpose are Sundari trees utilised?
(a) Rearing shellac worms.
(b) Furniture, railway carriages and bridges.
(c) Hard durable timber for construction purposes and boat making.
(d) None of the above.

Ans : MAIN 2014

Thus (d) is correct option.

22. Why do tropical deserts have stunted growth?
(a) Due to high temperature these trees do no grow to great heights.
(b) Due to scarcity of rain water the trees do not get enough water for their growth.
(c) Due to long roots that reach deep underground and therefore do not attain height.
(d) None of the above.

Ans : SQP 2008

Thus (b) is correct option.

23. In_____, trees are grown along with crops and livestock is also reared.
(a) farming
(b) agro-forestry
(c) socio-forestry
(d) agriculture

Ans : COMP 2005

Thus (b) is correct option.

24. The part of natural vegetation which has remained undisturbed by humans is:
(a) social forestry
(b) agro-forestry
(c) virgin vegetation
(d) deciduous forests

Ans : MAIN 2001

Thus (c) is correct option.

25. The two main centres for forest research are in:
(a) Dehradun
(b) Delhi
(c) Coimbatore
(d) Both (a) and (c)

Ans : SQP 2011

Thus (d) is correct option.

26. The term used for science of cultivating trees is:
(a) forestry
(b) agriculture
(c) gardening
(d) silviculture

Ans : COMP 2005

Thus (d) is correct option.

27. Forests are important because they:
(a) provide an environment for wildlife
(b) provide man land to build houses
(c) provide food crops
(d) provide clothes for men

Ans : MAIN 2014

Thus (a) is correct option.

28. Littoral means the same as:
(a) mountain
(b) solar
(c) volcanic
(d) tidal

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175. (i) Name the soil which occupies largest area after the alluvial soil.
(ii) What is dry farming ?
(iii) Why is the desert soil alkaline in nature?

or

'the desert soil contains high proportion of salts'. Why ?

Ans : COMP 2023

(i) Black soil or Regur soil.
(ii) Dry farming is a method of farming in regions with limited moisture, relying on soil moisture conservation techniques and drought-resistant crops.
(iii) Desert soil is alkaline due to the accumulation of soluble salts, high evaporation rates, and limited rainfall, which prevents leaching of these salts.

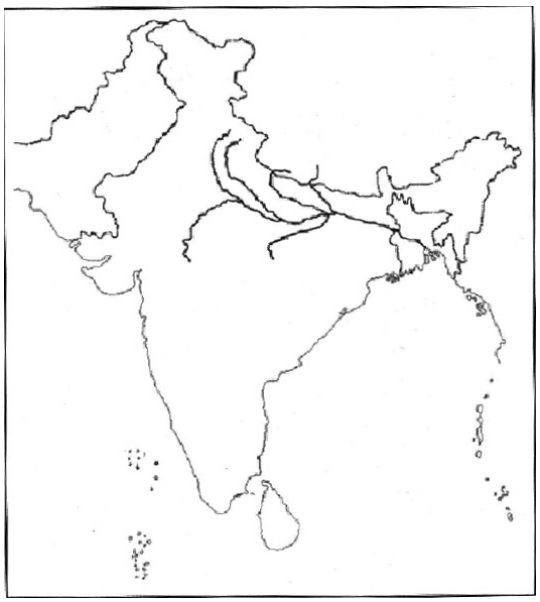
CASE BASED QUESTION

176. Study the picture given and then answer the follow questions.
(i) What is the type of farming shown above?
(ii) How is the type of farming helpful to agriculture?
(iii) Name another method used which is similar to the one shown above.

Ans : MAIN 2024

(i) terrace farming
(ii) Prevents soil erosion
(iii) Contour Ploughing

177. (a) What type of soil is found in the region through which the river flows?
(ii) How is the soil formed?
(iii) Why is it considered the most productive soil in India?



Ans : MAIN 2023

(i) Alluvial Soil
(ii) Alluvial soil is created through the deposition of silt carried by rivers originating from mountainous areas.
(iii) this fine-grained and highly fertile soil is ideal for the cultivation of food crops in India.

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172. (i) How does deforestation lead to soil erosion ?
(ii) State two methods of controlling erosion of soil caused by running water.
(iii) Name two important agents of erosion. For each, state one method of controlling the erosion caused.

Ans : MAIN 2021

(i) Forests are cleared to provide more land for cultivation. the removal of trees leaves the soil exposed to water and wind, which results in soil erosion.

(ii) Methods of controlling soil erosion caused by running water include :
(a) Growing trees
(b) Plugging Gullies
(c) Constructing Bunds
(d) Deepening River Beds and Widening River Banks

(iii) The two primary agents of erosion are water and wind.

Methods of Controlling Erosion:

(i) Erosion by Water : During intense rainfall, heavy runoff can create deep gullies. Gully erosion removes nutrients and a significant amount of loose soil, making the soil unproductive and eventually turning it into badlands. to stop gully erosion, gullies can be filled with stones and pebbles, or fast-growing grasses can be planted in the gullies to prevent their expansion.

(ii) Erosion by Wind : Wind erosion decreases soil productivity as high-velocity winds carry away essential nutrients needed by plants. this type of erosion occurs in areas that lack vegetation. to combat wind erosion, more trees should be planted along the edges of fields, wastelands, and steep slopes. If planting trees is not feasible, grasses should be grown instead to ensure that no land remains bare of vegetation.

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173. Name the two types of alluvial soils and state three differences between them.

Ans : MAIN 2018

Following are the two types of alluvial soils :
(i) Bhangar, and
(ii) Khaddar.

Differences between the Bhangar and Khaddar are as follows:

Bhangar	Khaddar
It is non-porous and clayey soil.	It is porous and loamy soil.
It is found in the higher level in the plains at river terraces.	It is found in the lower level in the plains near river's new terrace.
It is less fertile as compared to khaddar. this is due to deposition of	It is more fertile as compared Bhangar. new layers by floods during monsoon.

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174. What are the causes of soil erosion in :
(i) Shiwaliks or the Outer Himalayas.
(ii) North-Eastern parts of India.
(iii) Arid regions of India.
(iv) Hilly areas of the South.

Ans : SQP 2022

(i) Destruction of Vegetation : the removal of vegetation is the primary cause of soil erosion in hilly areas. Without plants to hold the soil in place, the soil surface becomes loose and is easily carried away by running water.

(ii) Heavy Rainfall and Flooding : Intense rainfall that results in frequent flooding significantly contributes to soil erosion.

(iii) Wind Erosion in Arid Regions : In deserts and dry areas with little to no vegetation, wind becomes the dominant agent of soil erosion. It blows away fine sand particles and deposits them in other locations, rendering both the source and destination areas less productive.

(iv) Steep Slopes and Poor Farming Practices: In this region, soil erosion is caused by steep slopes, heavy rainfall, and unscientific agricultural methods.

5. Key Species: Sal, teak, sheesham, jamun, bamboo, sandalwood.

4. TROPICAL DESERT FORESTS

(i) **Characteristics :** Sparse vegetation with deep roots, thick leaves and succulent stems to conserve water.

(ii) **Types :**
1. Semi-Arid Vegetation: 25-50 cm rainfall.
2. Arid Vegetation: Less than 25 cm rainfall, often sandy.

(iii) **Climate :** 25-50 cm rainfall, 25°C-27°C.

(iv) **Distribution :** Northern Gangetic Plains (Punjab, Haryana, Rajasthan, Gujarat), Deccan Plateau (Madhya Pradesh, Maharashtra), Southern Peninsula (Andhra Pradesh, Karnataka), Thar Desert.

(v) **Key Species :** Babool, date palms, kikar, catechu, palash.

5. LITTORAL FORESTS

(i) **Characteristics :** Thrive in marshy, saline, or coastal areas, preventing erosion and serving as nurseries for marine life.

(ii) **Climate :** 100-150 cm rainfall, 25°C-27°C, saline and fresh water mix.

(iii) **Distribution :** Delta regions of Ganga, Godavari, Krishna, Kaveri, Mahanadi; coasts of Odisha andhra Pradesh, West Bengal (Sunderbans), Tamil Nadu, Kutch, Kathiawar, Gulf of Khambhat andaman and Nicobar Islands.

(iv) **Key Species :** Sundari, mangrove.

6. MOUNTAIN OR MONTANE FORESTS

(i) **Types :**
1. Wet Temperature Forests: 1000-2000m altitude, evergreen broadleaf trees like oak and chestnut.
2. Temperate Forests: 1500-3350m altitude, coniferous trees such as pine, deodar, silver-fir, spruce, cedar.
3. Temperate Grasslands: Above 3600m, trees like silver-firs, pines, junipers, birches diminish near the snow line.
4. Alpine Vegetation: Above 3500-4000 m, dominated by shrubs, alpine grasslands, rhododendrons, berberis, birch, junipers, mosses, lichens.

(ii) **Climate :** Temperatures range from cool (~20°C) to below freezing at high altitudes, 100-300 cm rainfall.

(iii) **Distribution :** Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh.

(iv) **Key Species :** Chir (Pinus longifolia), deodar (Cedrus deodara), silver-fir (Abies spp.), blue-pine (Pinus excelsa), spruce (Picea smithiana).

7. FOREST CONSERVATION

Protecting forests is essential for sustainable development and the survival of all life forms. Key conservation measures include:

7.1 National Forest Policy

India's forest policy, established in 1894 and revised in 1952 and 1988, focuses on the protection, conservation and development of forests.

7.2 People's Participation

Traditional practices and tribal communities play a vital role in forest conservation. Examples include:
1. Sariska Tiger Reserve (Rajasthan): Villagers opposed mining activities.
2. Chipko Movement: Started in the 1970s in Chamoli (Uttarakhand), this non-violent movement aimed to protect trees and forests.

7.3 Van Mahotsav

Launched in 1950 by Shri Kanhiyalal M. Munshi, Van Mahotsav is a week-long tree-planting festival held annually in July across India, resulting in the planting of lakhs of trees.

7.4 Social Forestry

"Social forestry" involves planting fuelwood, fodder, timber and grasses to reduce pressure on traditional forests. It includes agro-forestry, community forestry and urban forestry.

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7.5 Joint Forest Management (JFM) Programmes

State governments implement JFM programmes, entrusting village communities with forest protection and management, especially in degraded areas. Odisha was the first to start this in 1988. Communities form forest protection committees (Van Sanraksha Samiti or VSS) and development societies to manage daily operations.

MULTIPLE CHOICE QUESTION

1. Read the table and identify the pair that is correctly matched:

	Natural Vegetation Belt	Tree
P	Tropical evergreen	Babool
Q	Tropical deciduous	Teak
R	Littoral	Ebony
S	Mountain forest	Banyan

(a) P
(b) Q
(c) R
(d) S

Ans : MAIN 2024

Thus (b) is correct option.

2. Which type of forest is found mostly in the coastal areas of India?
(a) Tropical Evergreen Forest
(b) Tropical Desert Forest
(c) Littoral Forest
(d) Tropical Deciduous Forest

Ans : MAIN 2023

Thus (c) is correct option.

3. The productive functions of forests include:
(a) Habitat for the wildlife
(b) Control the water flow
(c) Provide various products such as timber, fuel wood, leaves, etc.
(d) Producing oxygen

Ans : SQP 2021

Thus (c) is correct option.

4. Which of the following pairs is correctly matched?
(a) Babool - Tropical evergreen forest
(b) Sandalwood - Tropical deciduous forest
(c) Cinchona - Mountain forest
(d) Sal - Tidal forest

Ans : SQP 2021

Thus (b) is correct option.

5. Name the type of natural vegetation that is found in the windward side of the Western Ghats.
(a) Tropical Evergreen
(b) Tropical Deciduous
(c) Mangrove Forest
(d) Mountain Forest

Ans : COMP 2018

Thus (a) is correct option.

6. Which of the following is NOT a characteristic of desert vegetation?
(a) Short, stunted growth of vegetation
(b) Thick fleshy stems
(c) Broad leaves
(d) Long and deep roots

Ans : MAIN 2015

Thus (c) is correct option.

7. Why do we need forest conservation?
(a) Forests provide food for growing population
(b) Forests help in earning foreign exchange
(c) Forests help in maintaining ecological balance
(d) Forests look beautiful

Ans : SQP 2011

Thus (c) is correct option.

8. During which month do we celebrate VAN MAHOTSAV every year in India?
(a) In December to February time period
(b) In July to September time period
(c) In March to May time period
(d) In November to January time period

Ans : COMP 2007

Thus (b) is correct option.

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9. What is the term used to describe the growing of trees in various parts of the country?
(a) Re-afforestation
(b) Deforestation
(c) Agronomy
(d) Afforestation

Ans : MAIN 2005

Thus (d) is correct option.

10. Which of the following is true about natural vegetation?
(a) It refers to the plant community which has grown naturally.
(b) It has not been disturbed over a long time.
(c) It allows its individual species to adjust themselves to the climate and soil conditions.
(d) All of the above.

Ans : SQP 2003

Thus (a) is correct option.

11. Plants of a particular region or period, listed as species and considered as a group is called_____.
(a) Flora
(b) Vegetation
(c) Forest
(d) All of the above

Ans : COMP 2008

Thus (a) is correct option.

12. The assemblage of plant species living in association with each other in a given environmental set-up is called_____.
(a) Forest (b) Vegetation
(c) Flora (d) None of the above

Ans : MAIN 2013

Thus (b) is correct option.

13. What are the chief characteristics of Tropical Rain forests?
(a) They appear green all the year round.
(b) They have dense canopy of trees.
(c) The trees do not have a fixed time to shed their leaves.
(d) All of the above.

Ans : SQP 2016

Thus (d) is correct option.

14. Why are the Tropical Evergreen forests not fully exploited?
(a) Because they do not shed their leaves and have dense canopy of trees.
(b) Because they are found in highly inaccessible areas.
(c) Because of tangled mass of canes, palms and bamboos.
(d) Because they have dense undergrowth.

Ans : COMP 2020

Thus (c) is correct option.

15. Tropical Deciduous forests are also known as_____.
(a) Rain forests
(b) Monsoon forests
(c) Tidal forests
(d) None of the above

Ans : MAIN 2001

Thus (b) is correct option.

16. Sandalwood belongs to_____category of forests.
(a) the Moist Deciduous forests
(b) the Dry Deciduous forests
(c) the Rain forests
(d) the Mountain forests

Ans : SQP 2004

Thus (a) is correct option.

17. The type of vegetation found in Tropical Thorn forests is_____.
(a) Thyrophytic
(b) Thornphytic
(c) Xerophytic
(d) Phylophytic

Ans : COMP 2009

Thus (c) is correct option.

18. At which of the following places Tidal forests are found?
(a) Wet marshy areas
(b) River deltas and along sea coasts
(c) Swampy areas
(d) All of the above.

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CHAPTER 6

NATURAL VEGETATION

SUMMARY

Natural vegetation comprises all plant life—trees, shrubs, herbs—that grows naturally in an area undisturbed by humans for extended periods. A "forest" refers to such long-established vegetation, supporting diverse biodiversity and complex ecosystems. Unlike plantations, which typically consist of uniform species, natural forests maintain rich biodiversity.

1. IMPORTANCE OF FORESTS

Forests are crucial for several reasons:

1. Climate Regulation: They produce significant oxygen and help regulate the Earth's climate.
2. Biodiversity: Forests provide habitats for numerous animal and plant species, ensuring ecosystem stability.
3. Medicinal Resources: About 25% of all medicines originate from rainforest plants.
4. Forest Products: Key products include timber, cellulose pulp, firewood, charcoal, sal, teak, gurjan and deodar.
5. Recreation: Forests offer recreational spaces through wildlife sanctuaries and national parks.
6. Food Source: They provide meat and other resources for tribal communities.
7. Minor Products: These include grasses, bamboo, fibers, gums, resins, dyes, spices, edible products, lac, honey and wax.
8. Environmental Protection: Forests prevent soil erosion, desertification and floods.

2. TROPICAL EVERGREEN OR RAIN FORESTS

(i) **Characteristics :** Dense with tall trees (up to 60 m), climbing plants and epiphytes. Trees retain leaves year-round due to continuous rainfall.

(ii) **Climate :** Over 200 cm annual rainfall, high humidity (70%+), temperatures between 25°C-27°C.

(iii) **Distribution :** Western Ghats, Lakshadweep andaman and Nicobar Islands, coastal Tamil Nadu and Odisha, lower Himalayan slopes, Bhabar and Terai regions and parts of North-Eastern India.

(iv) **Key Species :** Rosewood, gurjan, ebony, toon, mahogany, sheesham.

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3. TROPICAL DECIDUOUS FORESTS

Divided into:

(i) Tropical Moist Deciduous Forests:
   1. Rainfall: 100-200 cm
   2. Locations: Eastern India, North-Eastern states, foothills of the Himalayas, Jharkhand, West Odisha, Chhattisgarh, Madhya Pradesh, Chotanagpur Plateau, Shiwalik, Bhabar and Terai regions, eastern Western Ghats.

(ii) Tropical Dry Deciduous Forests:
   1. Rainfall: 70-100 cm
   2. Locations: Widely across India from the Himalayas to Kanyakumari, excluding Rajasthan, Western Ghats, West Bengal; also in rainier parts of the Peninsular plateau and plains of Bihar and Uttar Pradesh.
   3. Climate: 70-200 cm rainfall, 60-75% humidity, ~27°C.
   4. Environment: Distinct dry seasons cause trees to shed leaves for 1-2 months. Dominant trees reach 30-35 m with dense undergrowth.

Ans : SQP 2002

Thus (d) is correct option.

29. The type of forest spread over the Andaman and Nicobar Islands is:
(a) Tropical evergreen
(b) Tropical deciduous
(c) Tropical monsoon
(d) Thorn and Scrub

Ans : COMP 2006

Thus (a) is correct option.

30. With which forests are the pneumatophores related to?
(a) Tidal forests
(b) Deciduous forests
(c) Evergreen forest
(d) Both (a) and (b)

Ans : MAIN 2008

Thus (a) is correct option.

31. The most widespread forest in India is:
(a) Tropical deciduous
(b) Tropical evergreen
(c) Tidal forests
(d) Mountain forests

Ans : SQP 2003

Thus (a) is correct option.

32. Alpine forests are found above the height of:
(a) 6000 metres
(b) 3000 metres
(c) 9000 metres
(d) 1000 metres

Ans : COMP 2012

Thus (b) is correct option.

33. The Act which calls for strict punishment to those who violated the rules set by the government is:
(a) Government Conservation Act, 1962
(b) Forest Conservation Act, 1988
(c) Conservation Act of India
(d) None of these

Ans : MAIN 2013

Thus (b) is correct option.

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34. Two trees found in the evergreen forests are:
(a) Mahogany
(b) Ghir
(c) Ebony
(d) Both (a) and (c)

Ans : MAIN 2001

Thus (d) is correct option.

35. The vegetation in which trees have long roots for survival is:
(a) Mangrove
(b) Deciduous
(c) Afforestation
(d) Tropical deserts

Ans : SQP 2007

Thus (d) is correct option.

36. The height above which it is too cold and windy for trees to grow is:
(a) treeline
(b) snowline
(c) Both (a) and (b)
(d) Neither (a) nor (b)

Ans : COMP 2003

Thus (c) is correct option.

37. People do not cut down trees for:
(a) making woollen coats
(b) growing crops
(c) making furniture
(d) making houses

Ans : MAIN 2022

Thus (a) is correct option.

38. Plants that have ways to survive in dry regions are:
(a) pneumatophores (b) khajuri
(c) mangrove (d) xerophytic

Ans : SQP 2008

Thus (d) is correct option.

39. The trees of the tropical deciduous forests shed their leaves:
(a) to conserve soil
(b) for animals to breathe
(c) to prevent loss of moisture
(d) to allow growth of crops

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Ans : COMP 2002

Thus (c) is correct option.

40. The movement(s) showing community participation in the conservation of forests are:
(a) Beej Bachao Andolan
(b) Narmada Bachao Movement
(c) Chipko Movement
(d) Both (a) and (c)

Ans : MAIN 2013

Thus (d) is correct option.

41. Forests are co-------nsidered an important economic resource because they:
(a) cool the environment
(b) provide raw material for many industries
(c) provide home to the tribals
(d) provide scenic beauty

Ans : SQP 2006

Thus (b) is correct option.

42. What are the various forest conservation methods that can be undertaken?
(a) Afforestation and stopping indiscriminate felling of trees
(b) Large scale of deforestation and overgrazing
(c) Allowing animals to graze in farm land
(d) Maintaining records of forest areas

Ans : COMP 2017

Thus (a) is correct option.

43. Afforestation prevent soil erosion because:
(a) it reduces pollution.
(b) it protects the soil from being exposed.
(c) the roots of the trees bind the soil particles.
(d) trees produce fruits.

Ans : MAIN 2010

Thus (c) is correct option.

44. Which of the following features is not associated with Thorn and Scrub Forest?
(a) Xerophyte or Drought resistant
(b) Evergreen and Multilayered
(c) Long roots going deep in the ground
(d) Leaves turned into spines

Ans : SQP 2001

Thus (b) is correct option.

45. What is Social Forestry?
(a) The management and protection of forests and afforestation on barren lands with the purpose of helping in the social development.
(b) The practice of growing trees on farm lands
(c) Growing trees by social workers
(d) Forests used for social gathering

Ans : COMP 2008

Thus (a) is correct option.

46. In which vegetation belt multiple layer of trees is found?
(a) Tropical deciduous
(b) Tropical evergreen
(c) Thorn and scrub forest
(d) Tidal forest

Ans : MAIN 2012

Thus (b) is correct option.

47. Why are Sundarbans so called?
(a) The abundance of breathing roots
(b) A beautiful forest
(c) The abundance of Sundari trees
(d) Ban of cutting of trees

Ans : SQP 2007

Thus (c) is correct option.

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48. What is the other name of Littoral forests?
(a) Rain forests
(b) Monsoon forests
(c) Tidal forests
(d) Scrub lands

Ans : COMP 2018

Thus (c) is correct option.

49. What are the chief characteristics of monsoon forests?
(a) These regions receive a moderate rainfall.
(b) The trees shed their leaves in the dry season.
(c) The trees are found in pure stand.
(d) All of the above

Ans : MAIN 2001

Thus (d) is correct option.

ONE MARK QUESTIONS

50. How has the rising population of India resulted in the loss of forest cover?(Any one point)

Ans : MAIN 2024

The growing population is increasing the demand for land for agriculture and housing. As a result, deforestation and shifting cultivation practices to meet these needs are leading to a decline in forest cover.

51. In which natural vegetation belt is Sundari tree found?

Ans : MAIN 2023

The Sundari tree is found in the Mangrove forests (also known as littoral or tidal forests), particularly in the Sundarbans region of India and Bangladesh.

52. Name one region in India where Tropical Evergreen Forest is found.

Ans : MAIN 2023

Western Ghats

53. What is an ecosystem ?

Ans : COMP 1997

The interdependence of species of plants and animals in a given area forms a single ecosystem.

54. Name an area in India where Tropical Monsoon Forest is found.

Ans : SQP 2018

(i) Foothills of the Himalayas
(ii) Jharkhand
(iii) West Odisha.

55. Name two areas where the thorn and the scrub forests are formed.

Ans : MAIN 2018

Punjab plains, Northern Madhya Pradesh, South-West Uttar Pradesh, (Bundelkhand plateau).

56. What is an ecosystem ?

Ans : COMP 1997

The interdependence of species of plants and animals in a given area forms a single ecosystem.

57. What is social forestry ?

Ans : SQP 2001

It refers to the management and protection of forests and afforestation on barren lands with the purpose of helping in the environmental, social and rural development.

58. Why does the vegetation in Himalayas vary with altitude?

Ans : MAIN 2012

Because the temperature decreases as altitude increases. Both the temperature and rainfall decreases with height.

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59. Why does Tropical Evergreen forests appear dark inside the forests?

Ans : COMP 2008

Because of the dense canopy of trees which do not allow enough sunlight to reach the ground.

60. Name two areas where Tropical deciduous vegetation is found.

Ans : SQP 2003

These forests are found in the rainier parts of the Pennisular Plateau and the plains of Bihar and Uttar Pradesh.

61. Why do the Coniferous trees of mountain forests have conical shape ?

Ans : MAIN 2013

Because the cone like structure enables the tree to slide down the snow and not to accumulate on the leaves and branches.

62. What is natural vegetation or virgin vegetation ?

Agro-forestry	Traditional-forestry
It is the scientific method to maintain agricultural output and forests products.	It is old method to use the forests recklessly for settlement and agriculture.
Agriculture and forests are maintained side by side.	Forests are burnt or cleared for agriculture and settlement.
It is an ideal method to get best results out of the limited land.	It is a wasteful method to destroy forests for settlements.
Japan has developed very good system of agro-forestry by growing mulberry trees on the borders of the fields.	Shifting agriculture is an example of traditional forestry by clearing the forest resulting in damaging deforestation.

124. State three objectives of agro-forestry.

Ans : SQP 2009

1. Agro-forestry promotes scientific farming for better crop yields and forest conservation.
2. It supports soil conservation, animal rearing and forest-based industries.
3. Agro-forestry enhances health, wealth and recreation through tourism and parks.

125. 'Rainfall is an important factor which decides type of vegetation of a particular region.' Justify.

Ans : MAIN 2003

Rainfall is crucial in determining the type of vegetation in a region, as it directly affects plant growth. High rainfall supports dense forests, like tropical rainforests, while moderate rainfall allows deciduous forests to thrive. In contrast, areas with low rainfall, such as deserts, support sparse vegetation like cacti. Therefore, the amount and distribution of rainfall significantly influence the type of vegetation.

126. (i) Name the major vegetation regions to which the ebony and the sundari trees belong.
(ii) Name major vegetation regions to which the Teak and Mahogany trees belong.

Ans : COMP 2001

(i) 1. Ebony : Tropical Rain Forest
2. Sundari : Mangrove Forests.
(ii) 1. Teak : Tropical Deciduous Forests.
2. Mahogany : Tropical Rain Forest region.

127. Why is the thorny type of vegetation found in Rajasthan ? Give two reasons.

Ans : SQP 2011

The main trees of thorny type are kikar, babul, khair, date palm, etc.
1. Rainfall below 75 cm allows only drought-resistant trees to grow in such conditions.
2. These trees have long roots and spiny leaves, adapting them to the dry environment.

128. Write any two points of difference between Dry deciduous and moist deciduous

Ans : COMP 2008

Dry Deciduous	Moist Deciduous
These are found on the peninsular plateau and the plains of Bihar and Uttar Pradesh.	They occupy vast areas between the Thar Desert, the Himalayas and on the eastern slopes of Western Ghats.
These are found where rainfall is 70-100 cm.	These are found where rainfall is 100-200 cm.
Teak is the dominant species.	Sal is the dominant species.

129. With reference to montane vegetation answer the following questions :
(i) "The vegetation on the Himalayas is upto higher altitude on the Southern slope than on the Northern slope". Give reason.
(ii) Name any four trees of the Himalayas.

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80. Where is the Alpine Vegetation found ?

Ans : MAIN 2002

At high altitudes, generally more an 3,600 metres above the sea-level.

81. "The trees of Tropical Evergreen Forest do not shed their leaves annually". Give reason.

Ans : COMP 2016

Due to high heat and high humidity.

82. Mention any two important trees of Tropical Rain Forest.

Ans : SQP 2010

Ebony and Mahogany.

83. Which is the typical Monsoon Forest ?

Ans : MAIN 2019

The Tropical Deciduous Forest.

84. Give one important use of the following trees:
(i) Teak
(ii) Bamboo

Ans : COMP 2014

(i) It is used in the manufacture of outdoor furniture.
(ii) It is an important source of fuel.

85. Why do the trees of Thorn Forest have stunted growth ?

Ans : SQP 2003

It is due to lack of minerals and water.

86. Why does the Thorn Forest have long roots ?

Ans : MAIN 2012

The long roots enable them to obtain water from deep underground.

87. Why does the Thorn Vegetation have sharp spines ?

Ans : SQP 2007

The sharp spines help the trees and bushes to conserve water and protect them from animals.

88. Mention the main plank of the forest policy of 1988.

Ans : COMP 2007

Protection, conservation and development of forest.

89. When was India's forest policy framed ?

Ans : MAIN 2019

1894

90. "The forest occur in and around the deltas, estuaries and creeks prone to tidal influences". Identify the forest.

Ans : COMP 2010

Littoral or Tidal forest.

91. Mention any two movements associated with forest conservation of India.

Ans : SQP 2000

Van Mahotsova and Chipko Movement.

92. Name the type of vegetation which is found in the areas recording over 150 cm of average rainfall and temperature between 25°C to 27°C.

Ans : MAIN 2011

Tropical Evergreen Forest.

93. Name the apex body which is responsible for forest research, planning and conservation.

Ans : COMP 2016

The Indian Council of Forestry Research and Education (ICFRE).

94. Where is Indian Forest Research Institute ?

Ans : SQP 2002

Dehradun

95. What is JFM ?

Ans : MAIN 2021

It is Joint Forest Management programme to develop and protect the forest with the help of local communities.

96. What is the importance of Sundari trees ?

Ans : COMP 2001

It provides hard and durable timber which is used for construction and building purposes

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112. What is meant by natural vegetation ?

Ans : SQP 2017

Natural vegetation refers to the plant life that grows naturally in a region without human interference, adapting to the climate and soil conditions of the area. It includes forests, grasslands, shrubs and other plant types that occur in their natural habitats.

113. Give two points of difference between vegetation and forests.

Ans : COMP 2012

Vegetation	Forests
Vegetation consists of trees, grasses, shrubs and exists within an ecological system. It includes more than just forests.	Forests are one specific type of vegetation.
Vegetation types are based on the visible plant cover, which includes forests, woodlands, grasslands and shrubs.	Forest types are determined by factors like temperature, rainfall, topography, soil and terrain.
Vegetation contributes to a variety of landscapes, such as woodlands and grasslands.	Forests alone do not produce such diverse landscapes.

114. What is meant by 'farm forestry' ? State two of its advantages for farmers.

Ans : MAIN 2020

Farm forestry refers to the practice of growing trees on farmland alongside crops or livestock. Farmers plant trees on their agricultural land for various purposes, such as timber, fuel, fodder, or shade.

Two advantages for farmers:

1. Additional income: Farmers can earn extra income from selling timber, firewood, or fruits from the trees.
2. Soil conservation: Trees help prevent soil erosion and improve soil fertility, benefiting crop growth.

115. (i) Name the area where tropical rain forests are found.

(ii) Mention two main characteristics of tropical rain forests.

Ans : SQP 2002

(i) Tropical rainforests are found in areas such as the Western Ghats andaman and Nicobar Islands and parts of Northeastern India.

(ii) Two main characteristics of tropical rain forests :

1. These forests are dense, multi-layered and consist of a wide variety of trees and shrubs, with trees reaching heights of over 45 meters.
2. The thick canopy formed by tall trees prevents sufficient sunlight from reaching the ground, hindering the growth of herbs and grasses.

116. Give two points of difference between Tropical Evergreen and Tropical Deciduous Forests.

Ans : MAIN 2011

Evergreen Forests	Deciduous Forests
Found in regions like Assam, Meghalaya, Nagaland and the Western Ghats.	Located in Northern and Central India.
Thrive in areas with heavy rainfall, above 200 cm annually.	Grow in regions with moderate rainfall between 100 cm and 200 cm.
Common trees include Rosewood, Mahogany, Cinchona and Palm.	Trees like Sal, Teak, Sandalwood and Shisham are commonly found.
Fewer valuable trees, with more bushes present.	Trees are highly valuable and useful.

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104. Mention the temperature and rainfall conditions found suitable for its growth.

Ans : MAIN 2023

Tropical Evergreen Forests grow in warm, humid regions with temperatures above 25°C and annual rainfall over 200 cm, ensuring dense, year-round vegetation.

105. Write two reasons why monsoon deciduous forests are commercially more valuable than other types of forests.

COMP 2018, 2014

(i) Tropical forests produce trees like sandalwood, semal, teak and sal, which are utilized for making furniture and various other products.
(ii) These forests also provide bamboo, which is used in construction, furniture, as well as for producing fibre and paper.

106. Name any three trees found in monsoon deciduous forests and state one use of each of these trees.

Ans : SQP 2012

1. Teak: Used for making high-quality furniture and shipbuilding due to its durability and resistance to decay.
2. Sal: Commonly used in construction, especially for making beams and railway sleepers because of its strength.
3. Sandalwood: Valued for its fragrant wood, it is used in making perfumes, soaps and carvings.

107. How does forests have a favourable effect on the climate of the region ?

Ans : MAIN 2014

1. Forests are crucial in controlling the Earth's temperature and weather patterns by storing significant amounts of carbon and water.
2. They cool the atmosphere through a process known as evapotranspiration.
3. The roots of trees absorb a large portion of rainwater, gradually utilizing it during dry periods. They also regulate water flow, helping to prevent floods.

108. Give an important use of each of the following types of trees :
(i) Sundri
(ii) Sandalwood
(iii) Rosewood

Ans : COMP 2014

(i) Medicinal product
(ii) Handicrafts
(iii) Furniture

109. Name the natural vegetation largely found in the following regions :
(i) The delta of the Ganga river.
(ii) The windward side of the Western Ghats.
(iii) Deccan Plateau

Ans : SQP 2014

(i) Littoral or swampy forests
(ii) Tropical evergreen forests
(iii) Tropical deciduous

110. Name the type of forests found in the western part of the Western Ghats. Give two reasons why these are so named.

Ans : MAIN 2011

The type of forests found in the western part of the Western Ghats are Tropical Evergreen Forests. These forests are so named because :
(i) These forests are located in areas with a tropical climate, characterized by high temperatures and heavy rainfall, which is why they are called Tropical forests.
(ii) The trees in these forests retain their leaves throughout the year, which is why they are referred to as evergreen.

111. Name the tree as per its characteristic given below :
(i) The wood is hard and suitable for ship building.
(ii) The stilt roots are underwater during high tide.

Ans : COMP 2010

1. Teak : The wood is hard and ideal for shipbuilding.
2. Sundri : The tree has stilt roots that remain submerged during high tide.

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as well as for making boats.

97. What is main thrust area of social forestry ?

Ans : SQP 2004

The main thrust of social forestry is to reduce pressure on the traditional forest areas by developing plantations of fuelwood, fodder and grasses. ,Social forestry has become very popular during the last three decades.

TWO MARKS QUESTIONS

98. How is tropical monsoon forest useful for the Indian economy? (Any two points)

Ans : MAIN 2024

Tropical monsoon forest useful for the Indian economy due to following reasons :

(a) Timber Production: They supply valuable timber like teak, sal and sandalwood for construction and industries.

(b) Employment: Forest-based industries like logging and paper manufacturing provide jobs and support rural livelihoods.

99. Mention the climatic condition that leads to the development of tropical desert vegetation.

Ans : MAIN 2024

The climatic condition that leads to the development of tropical desert vegetation is extremely low and irregular rainfall, typically less than 25 cm annually, combined with high temperatures and arid conditions. This harsh climate supports sparse vegetation adapted to dry conditions.

100. Mention any two forest conservation methods that may be adopted to protect the forests.

Ans : MAIN 2024

Two forest conservation methods that may be adopted to protect the forests :

1. Afforestation: Planting trees in deforested or degraded areas to restore forest cover.
2. Controlled Logging: Regulating the cutting of trees to ensure sustainable use and prevent over-exploitation of forest resources.

101. State two ways in which forests help in protecting the environment.

Ans : MAIN 2023

Two ways in which forests help in protecting the environment :

(a) Preventing soil erosion : Forests hold the soil in place with their roots, reducing the risk of soil erosion caused by wind and water.

(b) Absorbing carbon dioxide : Trees absorb carbon dioxide during photosynthesis, helping to reduce greenhouse gases and mitigate climate change.

102. Mention two ways in which Tropical Desert vegetation has adapted to its environment.

Ans : MAIN 2023

Two ways in which Tropical Desert vegetation has adapted to its environment are :

(a) Water Storage and Conservation : Many plants, like cacti, have thick, fleshy stems to store water and a waxy coating to minimize water loss through evaporation.

(b) Deep Root Systems : Plants in tropical deserts often have extensive and deep root systems to access underground water sources and survive prolonged droughts.

103. Why is the Tropical Deciduous Forest commercially the most exploited forest belt of India? (Two points)

Ans : MAIN 2023

The Tropical Deciduous Forest is commercially the most exploited forest belt in India because :

1. These forests have high-quality hardwoods like teak and sal, which are valuable for timber and furniture.
2. The trees in these forests shed their leaves seasonally, making them more accessible for logging and other commercial activities.

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117. What are the climatic conditions under which Tropical Evergreen Forests develop ?

Ans : COMP 2016

Tropical Evergreen Forests develop in regions where the climatic conditions are ideal for their growth. These forests thrive in areas receiving more than 250 cm of annual rainfall. The average annual temperature ranges between 25°C and 27°C, providing a consistently warm climate. Additionally, the average annual humidity exceeds 77%, which, along with the abundant rainfall, ensures continuous moisture availability, supporting dense vegetation and growth throughout the year.

118. Mention the areas where Tropical Desert Vegetation thrives.

Ans : SQP 2010

These forests are primarily located in southwestern Punjab, Haryana, Uttar Pradesh, central and eastern Rajasthan, as well as in Madhya Pradesh and Gujarat.

119. Under what climatic conditions do Littoral forests develop?

Ans : MAIN 2004

These forests are developed in wet marshy areas, in river deltas, in saline or the swampy areas and along the sea coasts.

120. What are 'Tidal forests'? Name two typical trees found there.

Ans : COMP 2000

Littoral or swampy forests or Tidal forests, also known as Mangrove forests, are found in coastal regions and river deltas, where the land is regularly flooded by tidal waters. These forests thrive in saline, waterlogged conditions and are adapted to survive in such challenging environments.

Two typical trees found in tidal forests are:

1. Sundari
2. Mangrove palm (Nypa)

121. Study the given data carefully and answer the following questions :

(i) What type of vegetation is found in the zone which has a mean temperature of 18°C or above ?

(ii) What type of vegetation is found in the zone which has a mean average temperature of 17°C to 24°C ?

(iii) What type of vegetation is found in the snow covered zone ?

Ans : SQP 2006

(i) Tropical Evergreen Forests or Tropical Deciduous Forests are typically found in zones where the mean temperature is 18°C or above.

(ii) The type of vegetation found in zones with a mean average temperature of 17°C to 24°C typically includes tropical and subtropical vegetation.

(iii) Alpine vegetation or Tundra vegetation is typically found in snow-covered zones, characterized by sparse plant life like mosses, lichens and hardy grasses.

122. Describe the methods of protecting forests under the following heads :

(i) Afforestation

(ii) Using alternative source of energy.

Ans : MAIN 2018

(i) Afforestation : Implement a strict prohibition on cutting naturally growing trees. If tree removal is necessary, obtain the required permissions. Additionally, ensure that each removed tree is replaced by planting at least ten saplings (1:10 ratio).

(ii) Adoption of Renewable Energy Sources : In many regions around the world, including India, trees are cut down to provide firewood. To conserve forests, it is essential to utilize non-conventional or renewable energy sources such as solar, tidal and hydel energy.

123. Give two points of difference between agro-forestry and traditional forestry.

Ans : COMP 2004

The difference between agro-forestry and traditional forestry are as follows :

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Ans : COMP 2002

It refers to a plant community which has grown naturally without human aid and has been left undisturbed by human beings for a long time.

63. What is flora and fauna ?

Ans : SQP 2009

Flora : Plants of a particular region or period.
Fauna : The species of animals.

64. State any two factors that form the flora and the fauna ?

Ans : MAIN 2018

Soil, relief, climate and drainage.

65. What is a biome ?

Ans : COMP 2004

A very large ecosystem on land having distinct types of vegetation and animal life is called a biome.

66. Name any two regions in India where tropical evergreen forests are found.

Ans : SQP 2000

The Western Ghats, plains of Bengal and Odisha and the north-eastern India.

67. Name three commercially useful trees of the Tropical Rain Forests.

Ans : MAIN 2016

Ebony, mahogany and rosewood.

68. Mention any two factors responsible for deforestation.

Ans : COMP 2019

(i) Overgrazing by animals
(ii) Commercialisation of agriculture.

69. The 'Tropical Rain Forests appear green all the year round'. Give reason.

Ans : SQP 2003

There is no definite time for trees to shed their leaves.

70. Which forest type is also known as Monsoon forests ?

Ans : MAIN 2020

Tropical Deciduous forests.

71. Which are the most widespread forests of India ?

Ans : MAIN 2021

Tropical Deciduous Forests.

72. State the categories into which tropical deciduous forests are divided ?

Ans : COMP 2007

Dry deciduous and Moist deciduous.

73. Name one important trees each of the Moist Deciduous and Dry Deciduous Forests.

Ans : SQP 2002

Moist Deciduous — Teak
Dry Deciduous — Sal

74. Name some useful trees of the Thorn Forests.

Ans : MAIN 2016

Kikar, babul, khair and date palm.

75. Name the two Evergreen trees.

Ans : COMP 2010

Oak, rosewood.

76. Name some trees of mountains.

Ans : SQP 2004

Silver fir, pine and junipers.

77. What type of trees grow in the Tidal Forest ? Give an example.

Ans : MAIN 2013

Mangrove, Example : Sundari.

78. Name any one medicinal plant.

Ans : COMP 2001

Neem

79. Why are the leaves of the Thorn forests small and stems succulent ?

Ans : SQP 2008

Leaves of the Thorn Forests are mostly small to minimise evaporation and the stems are succulent to conserve water.

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Ans : SQP 2003

(i) The vegetation on the Himalayas is found at higher altitudes on the southern slope than on the northern slope because the southern slope receives more sunlight and rainfall, providing favorable conditions for plant growth, while the northern slope is cooler and receives less sunlight.

(ii) Four trees of the Himalayas are Pine, Fir, Cedar and Deodar.

130. (i) Why have the deciduous forests been given this name ?

(ii) Name some places where these are found.

Ans : MAIN 2004

(i) These forests are called deciduous because they shed their leaves for about six to eight weeks during summer to cope with water shortages.

(ii) They are found in the northeastern part of the peninsula, around the Chhota Nagpur plateau, covering areas of East Madhya Pradesh, South Bihar, West Odisha and the Shiwalik ranges.

131. With reference to vegetation in India, answer the following questions :

(i) Why are the southern slopes in the Himalayan region covered with thick vegetation as compared to the northern slopes of the same hills ?

(ii) Why are the western slopes of the Western Ghats covered with thick forests and not the eastern slopes ?

Ans : MAIN 2012

(i) The southern slopes of the Himalayas have thicker vegetation due to more sunlight and rainfall than the northern slopes.

(ii) The western slopes of the Western Ghats receive heavy rainfall, unlike the drier eastern slopes, leading to thicker forests.

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THREE MARKS QUESTIONS

132. Give a reason to explain each of the following:

(a) Mountains have varied vegetation.

(b) Stilt like/aerial roots are a typical feature of littoral forest.

(c) The tropical evergreen forests do not look bare at any time of the year.

Ans : MAIN 2024

(a) The vegetation on mountains varies due to changes in altitude, temperature and rainfall. As altitude increases, temperature decreases, leading to different types of vegetation at various elevations, ranging from tropical at the base to alpine at higher levels.

(b) In littoral forests, stilt-like or aerial roots help plants survive in waterlogged and saline conditions. These roots provide stability and allow the trees to breathe in oxygen-poor soils.

(c) Tropical evergreen forests receive heavy rainfall throughout the year, which allows the trees to retain their leaves continuously. As a result, there is no specific shedding season and the forest remains green and dense year-round.

133. State three main characteristics of the tropical deciduous forests or monsoon forests.

Ans : COMP 2010, 2015

1. Seasonal Shedding of Leaves: Trees in these forests shed their leaves during the dry season to conserve water.
2. Diverse Tree Species: These forests consist of a variety of tree species, such as teak, sal and sandalwood, which are valuable for timber.
3. Moderate Rainfall: These forests thrive in areas with moderate rainfall, typically between 100 to 200 cm annually.

134. Mention any four characteristics of the Mangrove Tidal Forests.

Ans : SQP 2012

1. Mangrove Tidal Forests are located

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Ans : COMP 2018

(i) Human activities: Various human activities, such as the expansion of agriculture, mining and industrialization, have led to significant deforestation, endangering plant species.

(ii) Pesticides and pollution: The widespread use of pesticides and environmental pollution pose serious threats to plant species worldwide, disrupting ecosystems and reducing biodiversity.

(iii) Industrialization: Pollution from chemical and industrial waste is another major factor contributing to the degradation of the natural environment, endangering numerous plant species.

167. Write three steps taken by the government for the protection and conservation of great biological diversity of India.

Ans : SQP 2001

(i) Several biosphere reserves have been established across India, such as the Nilgiri Biosphere Reserve in Karnataka, Tamil Nadu and Kerala and the Nanda Devi Biosphere Reserve in Uttarakhand.

(ii) The government has set up around 89 national parks, 480 wildlife sanctuaries and 35 zoological gardens to protect and conserve biodiversity.

(iii) Endangered species are being identified, with targeted efforts to preserve them, such as the Project Tiger initiative.

(iv) The hunting of wildlife has been banned and special forest officers have been appointed to ensure the enforcement of these laws.

168. Why is there need to conserve the biodiversity?

Ans : MAIN 2008

(i) All plants and animals in a given area are interconnected and dependent on each other and their physical surroundings, collectively forming an ecosystem.

(ii) Human beings have chosen their crops from the vast biodiversity of nature and have identified many medicinal plants for use.

(iii) Animals, selected from nature's abundant variety, serve as milch animals and provide essential resources such as draught power, transportation, meat and eggs. Fish also offer a nutritious source of food.

(iv) Numerous insects assist in pollinating crops and fruit trees, while others help control harmful insects through biological means.

169. With reference to the Tropical Deciduous Forest answer the following questions :

(i) "The entire forest never become bare at any time." Give reason.

(ii) How the trees correlate with the environment ?

(iii) Give any four important trees of Tropical Deciduous Forest.

Ans : COMP 2014

(i) In Tropical Deciduous Forests, trees shed their leaves at different times during the dry season, ensuring that the forest always retains some greenery.

(ii) The trees adapt to seasonal rainfall by shedding leaves during the dry season to conserve water and regrowing them during the monsoon.

(iii) Sandal wood, Teak, Sal and Bamboo.

170. With reference to natural vegetation of India answer the following questions :

(i) "The Evergreen Forests are found on the Western side of the Western Ghats whereas Tropical Moist Deciduous forests are found on the eastern side of the Western Ghats". Give reason.

(ii) How Tropical Rain Forest correlate with the environment ?

(iii) Name the tree the wood of which is suitable for railway sleepers. Give reason also.

Ans : SQP 2019

(i) The western side of the Western Ghats receives heavy rainfall due to the southwest monsoon winds, making it ideal for Evergreen Forests, which thrive in high humidity and continuous rainfall. In contrast, the eastern side receives

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like cacti, have succulent stems that store water for dry periods. These adaptations help them survive in regions with low rainfall and high temperatures.

139. (i) "Forests play a significant role in the prevention and control of soil erosion". Justify by giving two reasons.
(ii) "Forest increases the fertility of the soil." Explain.
(iii) "Forest check on spread of deserts". Explain.

Ans : COMP 2017, 2018

(i) The roots of trees and plants firmly anchor the soil, preventing it from being easily eroded by running water or wind. Vegetation, including trees, shrubs and grasses, slows down the flow of water, allowing it to be absorbed by the soil. Trees also reduce the force of strong winds, preventing the soil from being blown away.
(ii) When tree leaves fall and decompose, they form humus, which enriches the soil with nutrients. This process helps forests increase soil fertility.
(iii) In deserts, strong winds carry sand particles over long distances, contributing to desert expansion. The roots of trees and plants bind the sand, preventing it from being easily transported by the wind. Forests also add moisture to the air, further helping to limit the spread of deserts.

140. Explain any three forest conservation methods followed in India.

Ans : SQP 2019

1. Afforestation: Planting trees in deforested areas to restore forest cover and improve biodiversity.
2. Forest Protection Laws: Laws like the Forest Conservation Act (1980) regulate forest use and protect against illegal logging and encroachment.
3. Social Forestry: Involving local communities in planting trees on community lands to reduce pressure on natural forests and promote sustainable resource use.

141. Mention three methods for the conservation and development of forests in India.

Ans : MAIN 2011

(i) Long-Standing Forest Policy : India is among the select nations that have maintained a forest policy since 1894, aimed at protecting, conserving and developing its forest resources.
(ii) Promotion of Social Forestry : The Indian government actively promotes 'Social Forestry,' which focuses on creating and managing forests by the people, for the people.
(iii) Community Involvement in Forest Management : In 1990, the government introduced guidelines to engage village communities in the restoration and safeguarding of degraded forest areas.

142. With reference to Tidal Forest answer the following questions :
(i) Where are these forests found ?
(ii) Name any two regions of India where these kinds of forests are found.
(iii) Why these are known as Sunderbans ?
(iv) How the trees correlate with the environment?

Ans : COMP 2010, 2018

(i) These forests are situated in and around river deltas, estuaries and creeks that are subject to tidal influences and are therefore also known as delta or tidal forests.
(ii) Littoral forests are found along various coastal regions and within the confined deltas of major rivers such as the Ganga, Mahanadi, Godavari, Krishna and Cauvery.
(iii) The forests are named after the Sundari tree, which is the most important and prevalent species in these ecosystems, particularly evident in the Sunderbans.
(iv) Trees in these forests develop aerial roots that facilitate breathing in air. Their prop root systems enable them to absorb

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2. Air Pollution Control : They help control air pollution by absorbing pollutants and releasing clean oxygen.
3. Prevention of Soil Erosion : Forests prevent soil erosion by holding the soil together with their root systems.
4. Maintenance of Groundwater Levels : They facilitate water percolation into the ground, which helps maintain groundwater levels.
5. Oxygen Supply : Forests supply oxygen, which is essential for the survival of most living organisms.

158. Name any two trees that grow in the Tropical Deciduous Forests which provides Timber.

Ans : SQP 2013

(i) Teak: Teak wood is known for being moderately hard, durable and easy to work with. It is widely used in construction projects, shipbuilding, furniture manufacturing, railway carriages, sleepers and bridges due to its reliable properties.

(ii) Shisham: Shisham wood is hard and heavy, possessing great strength, elasticity and durability. It is utilized in construction, furniture making, bullock carts, agricultural implements, musical instruments and railway sleepers. Additionally, it can be crafted into decorative ornamental carvings because of its workable nature.

159. Define the following terms :
(i) Deforestation.
(ii) Fireline or Firebreak.
(iii) Silviculture.

Ans : MAIN 2011

(i) Deforestation is the widespread cutting down of trees in forested areas, often done without sustainable practices. This leads to the permanent loss of forests, contributing to issues like soil erosion, loss of biodiversity and increased carbon emissions.

(ii) A fireline or firebreak is a 5-meter wide path in forest areas that is cleared of all vegetation to prevent the spread of forest fires. This path acts as a barrier, depriving the fire of fuel and is an essential technique used to control and contain wildfires, thereby protecting the surrounding forest and environment.

(iii) Silviculture is the practice of preparing and managing land to grow trees, particularly for timber production. It includes soil preparation, planting and maintaining forests to ensure sustainable tree growth and forest health.

160. Name the main types of natural vegetation belts in India.

Ans : COMP 2006

The main types of natural vegetation belts in India are:
1. Tropical Evergreen Forests
2. Tropical Deciduous Forests (Monsoon Forests)
3. Tropical Thorn Forests and Scrubs
4. Mountain Forests
5. Mangrove Forests

161. Where are the tropical evergreen rain forests found? Why ? Name typical trees that grow there.

Ans : SQP 2012

Tropical Evergreen Rain Forests are located in the following regions:
(i) On the slopes of the Western Ghats, particularly in Tamil Nadu, Kerala and Maharashtra,
(ii) In parts of the Andaman and Nicobar Islands,
(iii) In West Bengal, as well as the Garo, Khasi and Jaintia Hills of North-East India,
(iv) On the slopes of the Eastern Himalayas.
These forests thrive in areas with heavy rainfall and high temperatures, which promote the growth of tall trees. Typical species found in these forests include Sisam, Bamboo, Rosewood and Ebony.

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148. Give a geographical reason for each of the following.
(i) Tropical Evergreen Forests are difficult to exploit for commercial purposes.
(ii) Delta area of river Ganga is called Sunderbans.
(iii) Forests are grown in and around the cities having Iron and Steel Industries and Thermal Power Plants.

Ans : COMP 2015

(i) The dense undergrowth and thick ground cover make it challenging to exploit these forests. They contain a variety of tree and shrub species, with trees of different heights. Additionally, the lack of transport facilities further complicates access, as these forests are primarily located in heavy rainfall areas like the western slopes of the Western Ghats and the hills of the northern regions.
(ii) The delta area of the river Ganga is called Sunderbans because it is dominated by Sundari trees, which thrive in the swampy and mangrove conditions of the delta.
(iii) Cities that host iron and steel plants experience significantly higher levels of pollution compared to those without such facilities. This increased pollution arises because steel manufacturing processes release various air pollutants, including particulate matter, sulfur oxides, nitrogen oxides, hydrocarbons and hydrogen fluoride. Additionally, these steel plants generate substantial dust, amounting to approximately 20 kilograms per metric ton of steel produced. To mitigate this pollution, trees are planted around cities with iron and steel industries. These trees serve as a natural barrier, helping to reduce dust levels and improve air quality.

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149. "The climate is one of the most important factor in deciding the character and extent of vegetation." Explain.

Ans : SQP 2020

(i) The variation in altitude, particularly above 915 meters on the slopes of the Himalayas and the hills of the Peninsular region, leads to a drop in temperature. This change in temperature affects the type of vegetation, transitioning it from tropical at lower altitudes to subtropical, temperate and ultimately alpine vegetation as the altitude increases.
(ii) In the Himalayan region, the southern slopes have a denser vegetation cover compared to the northern slopes. This is because the southern slopes receive more sunlight for a longer duration, which promotes plant growth.
(iii) The western slopes of the Western Ghats are covered with thick forests due to the higher amount of rainfall these areas receive, supporting lush and dense vegetation.

150. Give a geographical reason for each of the following :
(i) The forest area has greatly depleted in India.
(ii) The Tropical Evergreen forests are found on the western slope of the Western Ghats.
(iii) Acacia has long roots.

Ans : COMP 2010

(i) Rising population increases the need for food and leads to deforestation for housing and agricultural purposes.
(ii) Tropical Evergreen Forests are located on the western slopes of the Western Ghats because the region receives more than 200 cm of rainfall.
(iii) Acacia trees have long roots that allow them to access deep underground water, enabling them to survive in dry environments with limited water.

151. (i) State two characteristics features of tropical desert vegetation. Name two typical trees found here.
(ii) Why tropical deserts have stunted trees ?

Ans : SQP 2013

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along coastal regions that are influenced by tides, where mud and silt naturally accumulate.
2. These forests predominantly feature dense mangroves, with plant roots submerged beneath the water.
3. Major river deltas, including those of the Ganga, Mahanadi, Krishna, Godavari and Kaveri, are extensively covered by such vegetation.
4. In the Ganga-Brahmaputra delta, sundari trees thrive, providing durable and hard timber. Additionally, palms, coconuts, keora and agar are found growing in certain parts of the delta.

135. State three main features of the Tropical Rain Forests.

Ans : MAIN 2013

(i) These are evergreen forests located in regions with warm and wet climates.
(ii) They occur in areas receiving over 200 cm of rainfall, with a brief dry season.
(iii) These forests are found on the rainy slopes of the Western Ghats, the plains of Bengal and Odisha, as well as in northeastern India.
(iv) The trees in these forests grow rapidly, often reaching heights of 60 meters or more.
(v) Commercially valuable trees in these forests include ebony, mahogany and rosewood.

136. (a) Name any three regions where Thorn Forests are found.
(b) Mention any three characteristics of the Thorn Forests.

Ans : COMP 2017, 2018

(a) Rajasthan, Gujarat, Madhya Pradesh.
(b) Three characteristics of the Thorn Forests:
(i) Acacias, palms, euphorbias and cacti are the main plant species.
(ii) Leaves are mostly thick and small to reduce water loss through evaporation.
(iii) The stems are succulent to retain water.

137. With reference to Tropical Evergreen Forest answer the following questions :
(i) Why the trees grow vigorously ?
(ii) Why the floor lacks grasses ?
(iii) Why these forest have been not exploited?

Ans : SQP 2012, 2015

(i) The trees grow vigorously due to high levels of rainfall and temperature.
(ii) These forests are densely packed, with trees reaching heights over 60 meters. As a result, sunlight is unable to penetrate to the ground.
(iii) (a) The dense undergrowth makes access difficult.
(b) The presence of numerous species growing together makes it challenging to commercially utilize any single variety of tree.
(c) The region lacks adequate transportation facilities, hindering exploitation.

138. With reference to Thorn Forest answer the following questions :
(i) Mention any four regions of India where such type of vegetation is found.
(ii) Name any four trees.
(iii) How do the plants correlate with the environment or adapt to the climate ?

Ans : MAIN 2017, 2018

(i) 1. Rajasthan
2. Gujarat
3. Madhya Pradesh
4. Parts of the Deccan Plateau
(ii) 1. Acacia
2. Cactus
3. Babul
4. Date palm
(iii) The plants in thorn forests are well adapted to the arid and semi-arid climate by developing features that conserve water. They have long roots that penetrate deep into the soil to access underground moisture. Their leaves are often small, thick, or modified into spines to reduce water loss through transpiration. Additionally, some plants,

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and around deltas, estuaries and creeks that experience tidal influences. Due to their unique location and environmental conditions, they are frequently referred to as delta or swampy forests, reflecting their association with these dynamic ecosystems.

155. Explain how is man responsible for the reduction of forest cover in India.

Ans : SQP 2016

Human activities have significantly overexploited forests to meet both essential needs and excessive demands, leading to a substantial decline in forest cover. The primary factors contributing to this deforestation includes :

1. Agricultural Expansion: Rapid population growth and the increasing need for food have necessitated the clearing of forests to convert them into agricultural land.
2. Conversion to Pasture Lands: Forested areas are being transformed into pasturelands to support the expansion of dairy farming and cattle ranching.
3. Overgrazing: In tropical and subtropical regions, excessive grazing by livestock has caused widespread degradation of natural vegetation within forests.
4. Rising Timber Demand: The ever-increasing demand for timber for various purposes, driven by industrial expansion and urbanization, has intensified the problem of deforestation.
5. River Valley Projects: The construction of multi-purpose river valley projects has led to the submergence of land and the destruction of forested riverbanks.

156. Give a geographical reason for each of the following :

(i) Littoral forest vegetation has breathing roots.

(ii) Forests are often compared to human lungs.

(iii) Van Mahotsav is celebrated in our country every year.

Ans : MAIN 2008

(i) Due to waterlogged conditions, the roots of mangrove trees often lack sufficient oxygen during high tides. To adapt to this challenge, certain mangrove roots grow vertically above the ground. These vertical roots are equipped with specialized pores that allow the trees to absorb oxygen directly from the air. Meanwhile, the lower portions of the roots remain submerged underwater during high tides. This unique root structure ensures that mangrove trees can effectively breathe and survive in their frequently inundated coastal environments.

(ii) Forests play a pivotal role in the carbon cycle by absorbing atmospheric carbon dioxide through the process of photosynthesis. This absorption helps in maintaining the purity of the air by reducing the concentration of greenhouse gases that contribute to atmospheric pollution. By sequestering carbon dioxide, forests not only purify the air but also aid in controlling climate change and global warming. Their ability to act as natural carbon sinks makes them essential for sustaining environmental balance and promoting a healthier atmosphere.

(iii) Van Mahotsav, commonly referred to as the festival of trees, is celebrated annually across the country to raise awareness about the crucial importance of trees. This festival aims to encourage people to actively participate in planting more trees, thereby promoting environmental conservation and fostering a greener, healthier environment for future generations.

157. Mention three reasons why forests must be conserved.

Ans : COMP 2002

Forests must be conserved because they provide numerous vital benefits :

1. Regulation of Climate : Forests have a favorable influence on temperature and rainfall patterns, helping to regulate the climate.

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necessary gases and essential nutrients from the atmosphere. Additionally, their leaves, stems and roots are specially adapted to thrive in brackish water conditions.

143. Explain why the forest cover in India is shrinking ?

Ans : SQP 20085

1. Agriculture expansion leads to clearing of forests for cultivation.
2. Urbanization causes deforestation for city and infrastructure development.
3. Industrialization clears forest land for mining and industrial projects.
4. Illegal logging depletes forests for timber and fuel.
5. Overgrazing by livestock degrades forest areas, preventing regeneration.

144. Name the natural vegetation found in the following regions.
(i) The Western slopes of the Western Ghats.
(ii) The Nilgiris
(iii) Western Rajasthan

Ans : MAIN 2017

Natural Vegetation found on :
(i) Tropical Evergreen forests.
(ii) Mountain forests/Deciduous forests, mixed forests/coniferous forests.
(iii) Thorn Forests and Scrubs.

145. With reference to vegetation answer the following questions :
(i) Why there is need for conservation of forests ?
(ii) Mention any four major forest products.
(iii) Mention any four minor forest products.

Ans : COMP 2012, 2019

(i) Forests need to be conserved because they play a critical role in maintaining ecological balance, preventing soil erosion, regulating the water cycle, supporting biodiversity and providing resources like timber and fuel. They also help combat climate change by absorbing carbon dioxide.
(ii) Major forest products: Timber, firewood, pulp, bamboo.
(iii) Minor forest products :Grasses, fibres, oils, leaves.

146. Name the tree, the timber of which could be used for the following :
(i) A soft and white timber used for making toys and match boxes.
(ii) A hard durable timber used for ship building and furniture making.
(iii) A sweet smelling timber which yields an oil, used for making handicrafts.

Ans : SQP 2013

(i) Semal
(ii) Mahogany
(iii) Sandalwood

147. Give a geographical reason for each of the following :
(i) The Western Ghats are covered with thick evergreen forests while the Eastern Ghats are covered by deciduous forests.
(ii) Tropical evergreen forests have tall trees and appear green all the year round.
(iii) Deciduous forests are commercially most exploited.

Ans : MAIN 2007

(i) The Western Ghats are covered with thick evergreen forests because they receive heavy rainfall from the southwest monsoon, while the Eastern Ghats receive less rainfall, supporting deciduous forests that shed leaves during dry seasons.
(ii) Tropical evergreen forests have tall trees and appear green all year round because they are located in regions with heavy rainfall and no distinct dry season, allowing continuous growth without shedding leaves.
(iii) The trees of these forests provide timber, fruits and other useful products. Large tracts of these forests have been cleared for agricultural activities.

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162. (a) Name one region in India for each of the following :
(i) Tidal forests.
(ii) Thorm and Scrub
(b) Explain why Thorn and Scrub forests are found in the above mentioned region.

Ans : MAIN 2012

(a) (i) West Bengal.
(ii) Rajasthan.
(b) Thorn and Scrub forests are found in Rajasthan due to the region's arid and semi-arid climate. These areas experience low rainfall (below 70 cm annually) and high temperatures, which limit the growth of dense vegetation. As a result, the forests consist of thorny bushes, scattered trees and shrubs adapted to drought-like conditions, such as Acacia and Cacti.

163. (i) What is natural vegetation or virgin vegetation ?
(ii) What is flora and fauna ?
(iii) What is an ecosystem ?

Ans : COMP 2008

(i) Natural or virgin vegetation refers to the plant life that grows in a region without human intervention. It includes indigenous plants that have developed naturally over time and it exists in its undisturbed form, untouched by human activities like farming, deforestation, or urbanization.
(ii) Flora refers to the plant species that are native to a particular region or environment. Fauna refers to the animal species that live in a specific region or habitat.
(iii) An ecosystem is a complex network or community of living organisms (plants, animals and microorganisms) interacting with each other and their physical environment (air, water, soil). It includes both biotic (living) and abiotic (non-living) components that work together to sustain life in a balanced environment. Examples of ecosystems include forests, deserts and oceans.

164. Describe the altitude zones of vegetation in the mountainous regions.

Ans : MAIN 2011

In the Himalayan region, vegetation varies with altitude:
1. In the foothills (Shiwalik range), tropical deciduous forests dominate, with Sal being the most economically significant tree species.
2. At altitudes between 1000 m and 2000 m, evergreen forests are prevalent, featuring trees such as beech, chestnut, oak and ash. At higher elevations within this zone, chir and chil trees become more common.
3. In the zone between 1500 m and 3000 m, typical coniferous trees like pine, cedar, silver fir and spruce grow. These trees are characteristic of the dry temperate climate found in the inner Himalayas.
4. Above 3600 m, the vegetation mainly consists of alpine shrubs, scrubs and grasses.

165. With reference to Indian vegetation answer the following questions :
(i) 'The Tropical Rain Forests appear green all the year round.' Give reason.
(ii) Which are the most widespread forests of India ?
(iii) Why Tropical Evergreen Forests are found in most parts of the Western Ghats?

Ans : SQP 2003

(i) The trees in the tropical evergreen forests do not shed their leaves at the same time.
(ii) The most widespread forests in India are the Tropical Deciduous Forests (also known as Monsoon Forests). These forests are found in large parts of the country, including central, northern and southern India.
(iii) Tropical Evergreen Forests are found in most parts of the Western Ghats because the region receives heavy rainfall due to the monsoon winds, combined with high humidity and warm temperatures.

166. Quite a few species of plants are endangered in India. Why ?

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(i) Two characteristics features of tropical desert vegetation are :
1. Due to lack of sufficient rainfall, trees in these forests are stunted, with large areas covered by coarse grasses.
2. The plants remain leafless for most of the year, giving the forest a scrub-like appearance.

Two typical trees in tropical desert vegetation are Acacia, Cactus.

(ii) This is caused by limited rainfall of less than 50 cm and low humidity below 47 percent, which results in plants remaining leafless and resembling scrub vegetation.

152. (i) What are the characteristic features of deciduous forests?
(ii) Name the two type of deciduous forests.

Ans : MAIN 2005

(i) The characteristic features of deciduous forests are :
(a) These forests transition into moist deciduous forests in wetter areas.
(b) On the drier margins, they gradually degrade into thorn forests.
(c) Trees in these forests completely shed their leaves during the dry season.
(d) In the dry season, the forests resemble vast grasslands with bare trees.

(ii) Two types of deciduous forests are :
(a) Moist Deciduous Forests : Found in regions with higher rainfall, these forests remain lush for a longer part of the year.
(b) Dry Deciduous Forests : Located in areas with less rainfall, these forests shed their leaves more completely during the dry season.

153. Give a geographical reason for each of the following :
(i) Forests constitute an important natural resource.
(ii) Agro forestry is not vulnerable to population stress.
(iii) Tidal forests have profuse growth with tangle of climbers.

Ans : MAIN 2019

(i) (a) Forests provide timber used in construction, furniture making, shipbuilding and more.
(b) Softwoods such as bamboo and grasses serve as raw materials for industries producing wood pulp, paper and rayon.

(ii) Agroforestry differs from traditional forestry in that it is less susceptible to population pressures. It is developed in line with the socio-cultural practices of local communities. In fact, agroforestry collaborates with the local population, helping to alleviate the burden on traditional forestry resources.

(iii) These forests exhibit dense growth characterized by a tangle of climbers, which serves as a crucial adaptation for survival in the soft and shifting mud of their environment. This intricate network of climbing plants allows them to access sunlight while stabilizing themselves in unstable soil conditions, enhancing their chances of thriving in such challenging habitats.

154. Give a geographical reason for each of the following :
(i) Nilgiri region has variety of vegetation type.
(ii) Sundari trees are used for boat making and construction purposes.
(iii) Littoral forest is also called tidal forest.

Ans : COMP 2007

(i) This is due to their proximity to the tropics and an elevation of only 1500 meters above sea level. As a result, the vegetation consists of temperate species in the higher regions and subtropical species in the lower areas of the Western Ghats.

(ii) The key characteristics of Sundari trees are that their wood is hard, strong and durable, making it highly suitable for boat building and other construction applications.

(iii) Littoral or swampy forests, often known as tidal forests, are typically found in

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relatively less rainfall, leading to the presence of Tropical Moist Deciduous forests, which are adapted to a seasonal dry period.

(ii) 1. Tropical Evergreen Forests are extremely dense, with thick undergrowth resulting from the heavy rainfall.
2. The combination of high temperatures and abundant rain allows the trees to grow rapidly, often reaching heights of over 60 meters.
3. These trees remain evergreen, meaning they do not shed their leaves, due to the consistently warm temperatures and ample water supply.
4. The forest floor is devoid of grasses because the dense canopy creates deep shade.

(iii) The Sal tree provides wood that is suitable for railway sleepers because of its hard, durable and strong timber, which can withstand heavy loads and resist decay, making it ideal for use in railway infrastructure.

171. With reference to forest policy answer the following questions.
(i) What are the main planks of the forest policy of 1988 ?
(ii) What is social forestry ?
(iii) Explain Chipko Movement.

Ans : MAIN 2013

(i) The main planks of the forest policy of 1988 :
1. Ensuring environmental stability by preserving and restoring ecological balance.
2. Conserving the natural heritage of forests and wildlife.
3. Preventing soil erosion and degradation in the catchment areas of rivers, lakes and reservoirs.
4. Controlling the spread of sand dunes in desert regions of Rajasthan and along coastal areas.

(ii) Social forestry refers to the management and protection of forests, along with the afforestation of barren lands, with the goal of promoting environmental, social and rural development, rather than focusing solely on generating revenue as in traditional forestry practices.

(iii) The Chipko Movement was a grassroots environmental movement that began in the 1970s in the Garhwal region of Uttarakhand. Local villagers, especially women, embraced trees to prevent their felling by contractors. The movement aimed to protect forests from commercial logging and raise awareness about the importance of forests for local ecosystems and communities. The term "Chipko" means "to hug," symbolizing the villagers' non-violent protest by physically hugging the trees to stop deforestation.

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172. (i) Explain the classification of forest for the purpose of administration.
(ii) Distinguish between Afforestation and Re-afforestation.

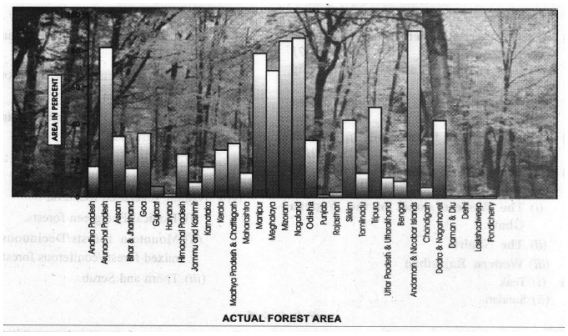
Ans : COMP 2009

(i) For the purpose of administration, forests are classified into three types :
(a) Reserved Forests: These forests are highly protected and activities like grazing, hunting and logging are prohibited unless permitted by the government. They are under the direct control of the state and are intended to conserve biodiversity and protect the ecosystem.
(b) Protected Forests: These have a lesser degree of protection compared to reserved forests. Certain activities like grazing and logging may be allowed under controlled conditions. The government has the authority to regulate and manage these forests to prevent degradation.
(c) Unclassified Forests: These forests are not fully regulated and are usually open for use by local communities. They have the least protection and are often subject to degradation due to unregulated use for firewood,

(iv) Name any two states having very low area under forests.

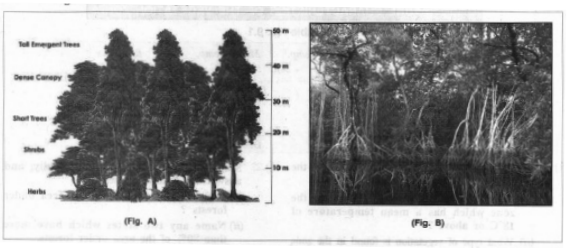
Ans :

(i) Nagaland



(ii) Nagaland and Mizoram
(iii) Andaman and Nicobar Islands
(iv) Punjab and Haryana

179. Carefully study the given pictures and answer the following questions :
(i) Identify the type of vegetation.
(ii) Name any two regions of India where the vegetation mentioned by you is found.



Ans :

(i) Fig.(A) : Tropical rainforest's, Fig.(B): Mangrove forests.
(ii) (a) Tropical rainforest's : Western Ghats and Andaman Nicobar Islands.
(b) Mangrove forests : The deltas of the Ganga and the Brahamputra rivers.

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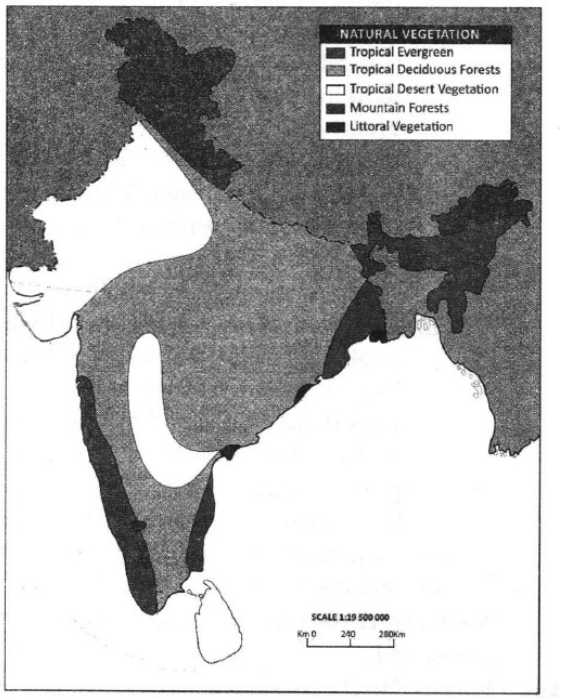
MAP BASED QUESTION

175. On an outline map of India mark the areas having:
(i) Tropical Evergreen
(ii) Tropical Deciduous Forests.
(iii) Tropical Desert Vegetation.
(iv) Mountain Forests.
(v) Littoral Vegetation.

Ans :



176. Study the diagram below and answer the questions that follows.

(i) Identify the type of vegetation.
(ii) Name the two regions where the vegetation is found.

Ans :

(i) Tropical Evergreen forests.
(ii) Western slopes of Western Ghats, Coast of Tamil Nadu and Odisha.

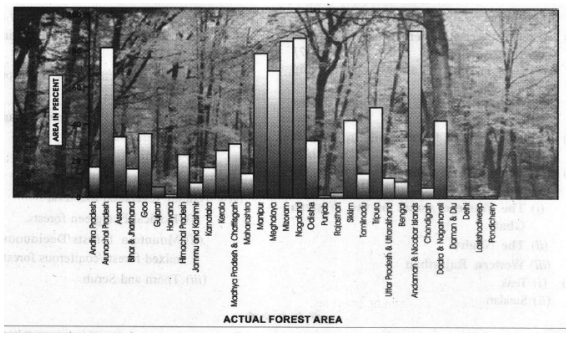
177. Study the diagram below and answer the questions that follows.

(i) Identify the type of vegetation.
(ii) Name the two regions where the vegetation is found.

Ans :

(i) Mangrove forest/vegetation.
(ii) The deltaic tracts of Ganga, Godavari, Krishna, Kaveri and Mahanadi.

178. Study the given bar graph carefully and answer the following questions :



(i) Which state has the highest area under forests ?
(ii) Name any two states which have more than 80% of the area under forests.
(iii) Which Union Territory has the highest area under forests ?

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timber and grazing.

(ii) Distinguish between Afforestation and Re-afforestation :

Criteria	Afforestation	Re-afforestation
Definition	Planting trees in areas that have never been forested.	Planting trees in areas where forests previously existed but were destroyed.
Objective	To create new forests and increase forest cover.	To restore lost or degraded forests to their original state.
Land Type	Barren, non-forested, or degraded land.	Previously forested land that has been cleared or degraded.
Focus	Establishing a new forest ecosystem.	Regenerating and rehabilitating the original forest ecosystem.
Purpose	Environmental improvement and biodiversity promotion.	Restoration of forest cover and recovery of ecosystem balance.

173. Distinguish between
(i) Flora and Fauna
(ii) Tropical Evergreen and Deciduous forests.

Ans : SQP 2003

(i) Distinguish between Flora and Fauna :

Flora	Fauna
The term, flora is used to denote plants of a particular region.	The term, fauna is used to denote animals of a particular region.
There are more than 47,000 plant species in India.	There are more than 89,000 species of animals.

(ii) Distinguish between Tropical Evergreen and Deciduous forests :

Tropical Rain Forests or Evergreen Forests	Tropical Deciduous Forests
These are found where the average rainfall is more than 200 cm.	These are found where he average rainfall is between 75 cm-200 cm.
These do not have a distinct season of shedding leaves.	They shed their leaves once a year to minimise evaporation.
Their height exceeed 60 m.	The trees are less than 50 m.
Ebony, mahogany and rosewood are some of the important trees.	Teak, sal, shisham and sandalwood are some of the important trees.

174. Why does India possess a great variety of flora and fauna ?

Ans : MAIN 2018

1. Varied Soil Types : India has a wide range of soil types, including fertile alluvial soil, black soil, laterite soil, desert soil and mountain soil. The sandy desert soils support plants like cactus and thorny bushes, while the wet, marshy deltaic soils are ideal for mangroves and other deltaic vegetation.
2. Diverse Climatic Conditions : India experiences a variety of climates, with temperatures ranging from as high as 55°C in some regions to as low as -45°C in others. This diversity in climate supports a wide range of plant species.
3. Impact of Precipitation : Precipitation significantly influences the type of vegetation. For instance, tropical rainforests thrive in the Western Ghats due to the region's heavy rainfall.

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CHAPTER 7

WATER RESOURCES

SUMMARY

1. INTRODUCTION

Water is crucial for human civilization, all living organisms, and natural ecosystems. It is utilized for activities such as drinking, sanitation, agriculture, transportation, animal husbandry, hydroelectric power, and various industrial and commercial purposes. Of the Earth's total water supply, 97.5% is saline, while only 2.5% is freshwater. Additionally, slightly more than two-thirds of this freshwater is stored in glaciers and polar ice caps.

2. INDIA'S WATER RESOURCES

India is fortunate to have hundreds of large and small rivers that traverse the entire country, making water an essential component for its predominantly agricultural economy. The main sources of water are:

1. **Surface Water :** Surface water refers to the water found on the Earth's surface in rivers, lakes, wetlands, and oceans. In India, approximately 4000 cubic kilometers of water is available annually from precipitation, with around 1150 cubic kilometers contributing as surface runoff. Major rivers such as the Indus, Ganga, and Brahmaputra provide about 60% of the country's surface water.
2. **Groundwater :** It is the water located below the Earth's surface, stored in porous soils and rocks. It plays a significant role, accounting for 98% of the planet's fresh water, with 75% of it being used for irrigation. Groundwater is replenished by water from rain and rivers migrating through the ground and is stored in cracks and crevices, leading to its uneven distribution.

3. IRRIGATION

Irrigation practices in India vary based on topography, soil, rainfall, groundwater availability, rivers, and crop requirements. The main types of irrigation include:

3.1 Canal Irrigation

Popular in northern India due to flat terrain and perennial rivers. Canals are constructed by building dams to store water. There are two types:

Inundation Canals : Unregulated water flow, common in the Sutlej-Ganga plains and Brahmaputra valley.

Perennial Canals : Water flows year-round, regulated by weirs and sluice gates.

Important canal systems include the Upper Ganga and Indira Gandhi canals in northern India and the Godavari and Krishna delta canals in southern India.

3.2 Tank Irrigation

Common in the peninsular plateau, tanks store rainwater in depressions created by earthen walls. Popular in Andhra Pradesh, Tamil Nadu, and Maharashtra due to uneven rainfall and impermeable rocks.

3.3 Well Irrigation:

Covering 40% of India's irrigated area, wells are a traditional method used in states like Punjab and Uttar Pradesh. They require a high water table and soft ground.

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28. There is a smaller amount of underground water in south India because this is a _____ region.
(a) Plain
(b) Plateau
(c) Mountainous
(d) Coastal

Ans : SQP 2012

Thus (b) is correct option

29. The state(s) where tube wells are common is/are:
(a) Punjab
(b) Kerala
(c) Uttar Pradesh
(d) Both (a) and (c)

Ans : COMP 2016

Thus (d) is correct option

30. _____ Irrigation cannot be used without electricity.
(a) Canal
(b) Sprinkler
(c) Tubewell
(d) Tank

Ans : MAIN 2020

Thus (c) is correct option

31. _____ Canals are taken out from rivers without building dams or rivers at their head.
(a) Perennial
(b) Reservoir
(c) Pucca
(d) Inundation

Ans : SQP 2002

Thus (d) is correct option

32. Sprinkler irrigation is efficient but is still not a very commonly used method of irrigation by the Indian farmers because:
(a) There is no loss of water by seepage.
(b) It is an expensive method of irrigation.
(c) There is no loss of water by evaporation.
(d) Farmers are scared of getting wet.

Ans : SQP 2012

Thus (a) is correct option

33. Well irrigation is not possible if the water is:
(a) Saline
(b) Brackish
(c) Muddy
(d) Both (a) and (b)

Ans : COMP 2006

Thus (d) is correct option

34. Kuls or Guls are used for irrigation in:
(a) Western Himalayas
(b) Gangetic Plains
(c) Deccan Plateau
(d) North-East Himalayas

Ans : SQP 2010

Thus (a) is correct option

35. The mode of storing rainwater in Jaisalmer and Bikaner is known as:
(a) Reht
(b) Khadins
(c) Johads
(d) Both (b) and (c)

Ans : COMP 2014

Thus (d) is correct option

36. The modern methods of irrigation commonly used are:
(a) Tubewells
(b) Perennial canals
(c) Tank irrigation
(d) Both (a) and (b)

Ans : MAIN 2018

Thus (d) is correct option

37. Why do the inundation canals have limited use ?
(a) Because they get water only when the rivers are in flood.
(b) Because they are taken out from a perennial river.
(c) Because they are constructed to store rain water.
(d) Because they occupy lot of space.

Ans : COMP 2016

Thus (a) is correct option

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Technical Requirements : Installing and maintaining rainwater harvesting systems requires specific technical skills and regular upkeep.
Seasonal Utilization : Water collected during the initial rainy season may not be needed by plants until the dry season, leading to potential underutilization.

6.3 Areas of Rainwater Harvesting

Rainwater harvesting is widely practiced in various regions of India, especially in Rajasthan, Gujarat, Andhra Pradesh, Assam, and Karnataka. These regions have developed traditional systems with distinct local names:

1. **Rajasthan :** Johads (small earthen dams) and Kunds (covered underground tanks).
2. **Gujarat :** Tankas (small underground tanks) and Khadins (long embankments to store runoff).
3. **Andhra Pradesh :** Cheruvu (reservoirs).
4. **Assam :** Dongs (ponds) used by the Bodo tribes.
5. **Karnataka :** Kere (tanks).

MULTIPLE CHOICE QUESTION

1. Which means of irrigation can be developed with minimum expenditure?
(a) Tube well
(b) Canal
(c) Well
(d) Drip irrigation

Ans : MAIN 2024

Thus (d) is correct option

2. Which of the following is a ground water source?
(a) Pond (b) Lake
(c) Spring (d) River

Ans : COMP 2023

Thus (c) is correct option

3. A planned protection, improvement and the wise use of natural resources is known as:
(a) Degradation (b) Erosion
(c) Depletion (d) Conservation

Ans : MAIN 2023

Thus (d) is correct option

4. The Bamboo Drip system is common in:
(a) Western states
(b) Eastern states
(c) North-Eastern states
(d) Southern states

Ans : COMP 2023

Thus (c) is correct option

5. Why is there a need to conserve water in India?
(a) A lot of water is polluted
(b) No water is found below the land in India
(c) Water is in abundance in India
(d) We receive lot of rain in summer

Ans : SQP 2021

Thus (a) is correct option

6. What are the advantages of rain water harvesting?
(a) Recharge of ground water and conservation of water
(b) Provide water through canals to the farms and its conservation
(c) It helps in harvesting of crops and its storage
(d) Provide water for multinational companies to produce packaged drinking water

Ans : COMP 2021

Thus (a) is correct option

7. Why is canal irrigation more popular in Northern Plains?
(a) The surface of land is almost flat and Soft soil is easy to dig
(b) To supply water to a number of cities in the plain area
(c) Rocky surface of the plain help in their construction
(d) Rivers are seasonal and so canals are needed

Ans : MAIN 2021

Thus (a) is correct option

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8. Which of the following is correctly matched?
(a) Tube well – Karnataka
(b) Tank – Punjab
(c) Lined well – Uttar Pradesh
(d) Canal – Mizoram

Ans : SQP 2010

Thus (c) is correct option

9. Which of the following is NOT a suitable condition for the development of tank irrigation?
(a) Presence of natural depressions
(b) Permeable rock structure
(c) Plenty of rain in rainy period
(d) Hard subsurface rock structure

Ans : COMP 2015

Thus (b) is correct option

10. Which among the following is a ground water source?
(a) Spring
(b) Pond
(c) River
(d) Lake

Ans : MAIN 2012

Thus (a) is correct option

11. What is the importance of "DRIP IRRIGATION"?
(a) It is an ultra-modern system of irrigation.
(b) It is cheaper than other sources.
(c) It can irrigate more area with less usage of water.
(d) It is used by almost all farmers in India.

Ans : SQP 2007

Thus (c) is correct option

12. What is an aquifer ?
(a) An underground well that readily gives out water on digging the land.
(b) An underground pond that was once a source of water and is now buried under rocks.
(c) An underground stream saturated with water that is transmitted readily on to the surface.
(d) None of the above.

Ans : SQP 2000

Thus (c) is correct option

13. Which of the following measures are not used to conserve water?
(a) Rainwater harvesting
(b) Using bottled drinking water only
(c) Water recycling
(d) Preventing water pollution

Ans : COMP 2004

Thus (b) is correct option

14. Which of the following is not a secondary source of water?
(a) Rivers
(b) Groundwater
(c) Lakes and ponds
(d) Rain

Ans : MAIN 2008

Thus (d) is correct option

15. Sprinkler irrigation is also known as _____.
(a) Seepage irrigation
(b) Overhead irrigation
(c) Protected irrigation
(d) Nozzle irrigation

Ans : SQP 2012

Thus (b) is correct option

16. Tanks form the main source of irrigation in _____.
(a) Punjab and Haryana
(b) The Deccan Plateau
(c) Madhya Pradesh and Gujarat
(d) All of the above

Ans : MAIN 2016

Thus (d) is correct option

17. _____ is not a conventional means of irrigation.
(a) Furrow irrigation
(b) Wells
(c) Tanks
(d) Inundation canals

Ans : COMP 2020

Thus (a) is correct option

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18. The most advanced and efficient method of irrigation is _____.
(a) Tank irrigation.
(b) Drip irrigation.
(c) Canal irrigation.
(d) Well irrigation.

Ans : MAIN 2002

Thus (b) is correct option

19. Most of the canals in India belong to which category?
(a) Perennial canals
(b) Inundation canals
(c) Navigation canals
(d) None of the above.

Ans : SQP 2006

Thus (a) is correct option

20. Which of the following least irrigated state of India is solely dependent on canals?
(a) Assam
(b) Mizoram
(c) Tripura
(d) Arunachal Pradesh

Ans : COMP 2010

Thus (b) is correct option

21. Which of the following is the most advanced and efficient method of irrigation?
(a) Furrow irrigation
(b) Spray irrigation
(c) Drip irrigation
(d) Sprinkler irrigation

Ans : MAIN 2014

Thus (c) is correct option

22. Which of the following is/are primitive method of irrigation?
(a) Sprinkler
(b) Tubewells
(c) Tanks
(d) None of these

Ans : SQP 2018

Thus (d) is correct option

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23. The method by which water is stored in tanks during the rainy season and used when needed is:
(a) Well irrigation
(b) Sprinkler irrigation
(c) Rahat system
(d) Rainwater harvesting

Ans : COMP 2022

Thus (d) is correct option

24. We need to conserve water for:
(a) Industrialisation
(b) Building houses
(c) Production of hydroelectric power
(d) Both (a) and (c)

Ans : MAIN 2001

Thus (d) is correct option

25. Natural hollows found in the earth's crust in which water collects when it rains are known as:
(a) Canals
(b) Tube wells
(c) Sprinklers
(d) Tanks

Ans : SQP 2000

Thus (d) is correct option

26. Name the most reliable type of well in India in times of drought.
(a) Tube wells
(b) Unlined wells
(c) Lined wells
(d) Kutcha wells

Ans : COMP 2004

Thus (a) is correct option

27. The water available on the surface of land, e.g. lakes, rivers etc. is:
(a) Earth water
(b) Surface water
(c) Underground water
(d) Tube well water

Ans : MAIN 2008

Thus (d) is correct option

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3.4 Tube Well Irrigation

Introduced in the 1930s, tube wells tap groundwater using deep borewells, particularly important in northern states like Punjab and Haryana.

3.5 Modern Methods of Irrigation

The modern methods of irrigation are as follows :

1. **Sprinkler Irrigation :** Water is distributed uniformly via overhead pipes, conserving water and reducing evaporation. It is suitable for arid regions.
2. **Drip Irrigation :** A water-efficient system where water is released through hoses to crops. Although expensive, it minimizes water loss.

4. CONSERVATION OF WATER

Water conservation is essential to manage limited freshwater resources for current and future needs.

Key reasons for conservation:

1. Industrialization, urbanization, and population growth increase water demand.
2. Groundwater depletion and uneven rainfall strain resources.
3. Only a small percentage of Earth's water is fresh.
4. Coastal areas face seawater intrusion, while inland areas experience salinization due to overuse.

5. WATER HARVESTING

Rainwater Harvesting is an effective and easy method of conserving and collecting rainwater for irrigation and other uses. It involves two main techniques:

1. Surface Runoff Harvesting (Groundwater Recharge):
2. This method captures rainwater to recharge groundwater using structures like:
3. **Recharge Pits :** Used where permeable rocks are near the surface.
4. **Trenches :** Built in areas with shallow permeable strata.
5. **Dug Wells :** Water from rooftops or runoff is directed to wells via filtration tanks.
6. **Trench with Recharge Wells :** Suitable for areas with impervious soil, storing large quantities of rainwater and filtering it to recharge groundwater.

6. ROOFTOP RAINWATER HARVESTING (RTRWH)

In this method, rainwater is collected directly from rooftops and stored. It is cost-effective and helps raise groundwater levels. Components include:

1. **Catchment :** Roof surface that collects rain.
2. **Transportation :** Pipes carry rainwater to storage.
3. **First Flush :** Removes contaminants from the initial rain.
4. **Filtration :** Water is filtered using sand, charcoal, or PVC filters to remove impurities.
5. This system provides a reliable method of water conservation, promoting efficient usage and boosting groundwater levels.

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6.1 Advantages of Rainwater Harvesting

Efficient Water Utilization: Rainwater harvesting effectively captures and uses water, reducing flood-like situations caused by runoff, erosion, and contamination of surface water with pesticides, sediments, metals, and fertilizers.

Chemical-Free Irrigation: It provides a clean source of water for landscape irrigation without the presence of chemicals such as fluoride and chlorine or dissolved salts and minerals from the soil.

Resource Conservation: Promotes both water and energy conservation, contributing to sustainable management of natural resources.

6.2 Disadvantages of Rainwater Harvesting

Disadvantages of rainwater harvesting are as follows:

Dependence on Rainfall : The effectiveness of rainwater harvesting is limited by the availability and predictability of local rainfall.

Variable Payback Period: The return on investment can vary based on the size of the storage system and the complexity of its design.

38. Which of the following is a type of canal found in India?
(a) Perennial Canal
(b) River Canal
(c) Artificial Canal
(d) Ground Canal

Ans : MAIN 2008

Thus (a) is correct option

39. Tank irrigation is popular in:
(a) South India
(b) North West India
(c) Eastern India
(d) Coastal region

Ans : SQP 2022

Thus (a) is correct option

40. A wall constructed across a river to regulate the flow of water is known as:
(a) Barrage
(b) Dam
(c) Embankment
(d) Divider

Ans : SQP 2000

Thus (a) is correct option

41. Which is the most advanced and efficient method of irrigation?
(a) Canal irrigation
(b) Well irrigation
(c) Drip irrigation
(d) Tank irrigation

Ans : COMP 2004

Thus (c) is correct option

42. Match the following and choose the correct alternative:

A.	Khatri	(i)	Western Ghats
B.	Johad	(ii)	Ladakh
C.	Zing	(iii)	Western Himalayas
D.	Surangam	(iv)	Central India

(a) A – (i) B – (iii) C – (iv) D – (ii)
(b) A – (iv) B – (i) C – (ii) D – (iii)
(c) A – (iv) B – (iii) C – (ii) D – (i)
(d) A – (i) B – (iv) C – (ii) D – (iii)

Ans : MAIN 2011

Thus (a) is correct option

43. The reason(s) for water scarcity in India is/ are:
(a) Excessive use of water by industries
(b) Erratic and unreliable rainfall
(c) People drink too much water
(d) Both (a) and (b)

Ans : COMP 2001

Thus (d) is correct option

ONE MARK QUESTIONS

44. What is the advantage of using Drip irrigation?

Ans : MAIN 2024

Drip irrigation ensures efficient water use by delivering water directly to the roots of plants, minimizing wastage and conserving water, especially in water-scarce regions.

45. Why is Drip irrigation not practiced on a large scale in India?

Ans : COMP 2024

Drip irrigation requires significant initial investment in equipment and setup, which many small-scale farmers in India may find too expensive to afford.

46. Where in India is Tank irrigation most widely used?

Ans : SQP 2023

Tank irrigation is most widely used in Southern India, particularly in Tamil Nadu and Andhra Pradesh.

47. Give one factor that has led to its popularity in the region mentioned by you.

Ans : MAIN 2023

One factor that has led to its popularity in this region is the undulating terrain with natural depressions, which make it easy to collect and store rainwater.

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Ans : COMP 2018

Jaisalmer and Barmen

80. From which river the Agra canal draws water ?

Ans : SQP 2001

Yamuna.

81. How people conserve or harvest water in hills and mountainous regions ?

Ans : COMP 2023

By building diversion channels to divert the water.

82. How people harvest water in the flood plains of Bengal ?

Ans : MAIN 2000

By building inundation channels to irrigate their fields.

83. Which is the main source of irrigation in North India ?

Ans : MAIN 2010

Tube-wells.

84. Which is the purest form of natural water ?

Ans : SQP 2004

Rainwater.

85. How people harvest water in the semi-arid and arid regions of Rajasthan ?

Ans : MAIN 2012

By building underground tanks.

86. Many people of arid and semi-arid regions construct underground rooms adjoining the water tanks. Give reason.

Ans : SQP 2016

By beating the summer heat, it would keep the room cool.

87. What is the percentage of water on Earth?

Ans : COMP 2022

71 percent of the Earth's surface is covered with water and the oceans holds 97.5 per cent of Earth's total water which is saline.

88. How much water is utilised by the agricultural sector in India?

Ans : MAIN 2002

About 92% of water is utilised by the agricultural sector in India.

89. Mention the three factors based on which different means of irrigation are used.

Ans : SQP 2006

Different means of irrigation are utitlised in India, based on the availability of surface (river) and groundwater, relief, soils and climatic conditions.

90. Name two states in which tube wells are extensively used. Give a reason to explain its importance as a source of irrigation.

Ans : COMP 2010

Uttar Pradesh and Bihar.
Because (i) They can irrigate large area. (ii) In dry period they do not dry up due to deep boring.

91. Name any two traditional rainwater harvesting methods.

Ans : SQP 2022

Kuls of Himachal Pradesh and Khadins of Gujarat are two traditional rainwater harvesting method.

92. What are inundation canals?

Ans : COMP 2012

These canals are taken out from the rivers and do not have any kind of weirs and barrages to regulate the flow of water from the rivers.

93. What are perennial canals?

These canals maintain its water flow throughout the year either from the river or from reservoir of the river projects.

94. Name the three modern means of irrigation.

Ans : SQP 2018

Modern means of irrigation includes furrow irrigation, spray irrigation and drip irrigation.

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63. What are the sources of freshwater ?

Ans : MAIN 2022

Precipitation, surface run off and groundwater.

64. Who proclaimed dams as 'the temples of modern India' ?

Ans : SQP 2001

Pandit Jawaharlal Nehru.

65. Name any two social movements which have been launched against the multi-purpose projects.

Ans : COMP 2023

'Narmada Bachao Andolan' and 'Tehri Dam Andolan.'

66. Name any two states which are involved in the Krishna-Godavari-dispute.

Ans : MAIN 2023

Karnataka and Andhra Pradesh.

67. What is groundwater resources ?

Ans : SQP 2000

Water beneath the surface of earth which saturates the pores and fractures of sand, gravel and rock formation.

68. What is a Tank or tanka ?

Ans : MAIN 2022

It is a man-made/natural structure which is used for preserving rainwater.

69. What is irrigation ?

Ans : MAIN 2008

The process of supplying water to crops by artificial means such as canals, wells, tube-wells, tanks, etc., from the sources of water such as rivers, tanks, ponds or underground water.

70. Mention any two factors on which the source of irrigation depend.

Ans : SQP 2012

(i) Topography
(ii) Rainfall

71. Mention any two important sources of irrigation.

Ans : COMP 2016

(i) Wells
(ii) Canals

72. Mention any two primitive methods of irrigation.

Ans : MAIN 2020

Wells and Tanks.

73. Name the two types of canals.

Ans : MAIN 2014

Two types of canals are :
(i) Inundation canals
(ii) Perennial canals

74. Which is the main source of irrigation in India ?

Ans : SQP 2002

Tube-wells.

75. Mention any two drawbacks of lined wells.

Ans : COMP 2006

(i) They can irrigate only a small area.
(ii) They may run dry.

76. Name any two states which are utilisating the groundwater resources at a alarming rate.

Ans : COMP 2004

Punjab and Haryana.

77. What is kul ?

Ans : COMP 2008

It is a circular village tank from which water is released as and when required.

78. What are perennial canals ? Give one example.

Ans : SQP 2014

Canals which flow throughout the year are known as perennial canals. For example Upper Bari Doab Canal.

79. Name two districts of Rajasthan irrigated by the Indira Gandhi Canal.

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Yes, there is plenty of rain in India, but yet we need irrigation because:
(i) The spatial and temporal variation of monsoon rainfall is not uniform across different locations.
(ii) Rainfall levels fluctuate annually, with some years experiencing good rainfall while others may have significantly less.

137. State two reasons why tank irrigation is popular in South India.

Ans : SQP 2001

Tank irrigation is favored in South India for the following reasons:
(i) The rocky surface in South India makes it challenging to dig canals and wells.
(ii) It is a simple and cost-effective method of irrigation.

138. Give a reason for the significance of irrigation in
(i) Punjab
(ii) Rajasthan

Ans : COMP 2023

(i) Punjab : Irrigation is significant in Punjab due to its reliance on water-intensive crops like wheat and rice, which require a consistent water supply to support high agricultural productivity.
(ii) Rajasthan : Irrigation is crucial in Rajasthan as it compensates for the region's arid climate and low rainfall, enabling cultivation in desert and semi-arid areas.

139. Which are the states of India where well irrigation is used?

Ans : SQP 2002

Well irrigation is predominantly used in states like Uttar Pradesh, Bihar, Punjab, and Haryana. It is also common in Rajasthan, Madhya Pradesh, Gujarat, and Maharashtra due to favorable groundwater availability.

140. Name two modern methods of irrigation. State one important reason for their growing popularity.

Ans : MAIN 2010

Two modern methods of irrigation are:
(i) Drip irrigation
(ii) Sprinkler irrigation
One important reason for their growing popularity is that these methods are highly efficient in water conservation, as they deliver water directly to the roots of the plants, minimizing wastage and reducing water consumption compared to traditional methods.

141. Why are inundation canals being converted to perennial canals? Give two reasons.

Ans : SQP 2004

Inundation canals are being converted to perennial canals due to:
(i) Unreliable water supply : Inundation canals rely on seasonal river overflows, making water availability uncertain, while perennial canals provide year-round water.
(ii) Increased agricultural productivity : Perennial canals ensure continuous water flow, supporting year-round farming and better crop yields.

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142. Name the two types of canals. Name two states where perennial canals are widely used.

Ans : COMP 2008

There are two types of canals: inundation canals and perennial canals. Perennial canals are widely used in states like Punjab and Haryana for efficient irrigation and year-round water supply.

143. How are the fields irrigated using the Persian wheel method ?

Ans : MAIN 2012

Fields are irrigated using the Persian wheel method, which features a partially submerged vertical wheel with buckets attached to its rim. As drought animals turn the wheel, it rotates a geared horizontal wheel, causing the buckets to fill with water. This water is then emptied into a trough above, which channels it to the fields where crops are planted.

95. Name the sources of surface water.

Ans : MAIN 2001

The sources of surface water are rivers, lakes, ponds, lagoons and backwater.

96. What do you mean by groundwater resource?

Ans : SQP 2023

Water beneath the surface of Earth which saturates the pores and fractures of sand gravel and rock formation.

97. What do you understand by irrigation?

Ans : COMP 2000

Irrigation refers to the process of supplying water to agricultural plants through wells, tanks, tube wells and canals.

98. Why do we need different modes of irrigation?

Ans : MAIN 2004

We need different modes of irrigation because of topographical features, availability of surface water, groundwater, soils and climatic condition.

99. Mention any two factors on which the source of irrigation depend.

Ans : SQP 2008

Topography and rainfall are two main factors on which the source of irrigation depends.

100. What do you mean by tanka and kul?

Ans : COMP 2001

Tankas are underground tank for storing drinking water.
Kul is a circular village tank from which water is released as and when required.

101. Why is sprinkler irrigation method suitable for arid and semi-arid region?

Ans : MAIN 2006

Modern irrigation method is suitable for arid and semi-arid region because these do not involve any loss of water by seepage or evaporation.

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102. Name the region of India which suffers from water scarcity.

Ans : COMP 2020

Rajasthan and Gujarat.

103. How people of West Bengal harvest water in the flood plains?

Ans : MAIN 2016

People of Bengal harvest water by building inundation canals.

104. Fromwhich river does the Mettur canal draw water?

Ans : SQP 2020

Mettur canal draws water from the Kaveri river. It irrigates about 1.2 lakh hectares and in Salem and Tiruchirapalli.

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105. What is a tank?

Ans : COMP 2002

Tank is a man made/natural structure which is used for preserving rainwater.

106. Which area of India is famous for bamboo irrigation system?

Ans : SQP 2010

The bamboo irrigation system is very popular in North-East part of India. This is 200 years old system used by the tribal farmers of Khasi and Jaintia hills.

107. What are check dams?

Ans : COMP 2014

Check dams are small barriers built across the direction of water flow on shallow rivers and streams for the purpose of water harvesting.

108. Mention two techniques of rooftop rainwater harvesting.

Ans : MAIN 2018

The two techniques of rooftop rainwater harvesting are as follows:
(i) Catchment
(ii) First Flush

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124. (i) How is fresh water obtained?
(ii) How is fresh water being renewed?

Ans : COMP 2004

(i) Fresh water is obtained from various natural sources such as rivers, lakes, streams, and groundwater (aquifers). It is also extracted from glaciers and ice caps in colder regions, and rainfall provides a significant portion of fresh water.
(ii) Fresh water is renewed through the hydrological (water) cycle, which includes processes like evaporation, condensation, precipitation, and infiltration. Water evaporates from bodies of water, forms clouds, and returns to Earth as precipitation (rain or snow). This water then replenishes rivers, lakes, and groundwater, maintaining the fresh water supply.

125. Give one geographical reason for each of the following statements :
(i) The modern means of irrigation are gaining popularity. Give two reasons.
(ii) Canal irrigation leads to the ground around it becoming unproductive.

Ans : COMP 2019, 2016

(i) Modern methods of irrigation, like the drip method, are gaining popularity because:
  (a) Water Conservation : These methods use water efficiently by delivering it directly to the roots, reducing wastage.
  (b) Improved Crop Yield : Precise water delivery improves soil health and enhances productivity.
(ii) Canal irrigation can lead to the surrounding ground becoming unproductive due to :
  (a) Waterlogging : Excessive seepage from canals raises the water table, causing soil saturation and reducing its fertility.
  (b) Salinization : Stagnant water from improper drainage leaves salts on the soil surface, making it unsuitable for cultivation.

126. Give two reasons why tanks are used for irrigation in the Deccan.

Ans : MAIN 2023

(i) Undulating Terrain : The Deccan Plateau has an uneven landscape, making it difficult to construct canals, so tanks are a suitable method for capturing and storing rainwater.
(ii) Hard Rock Structure : The region is composed of hard, rocky soil, which limits groundwater availability, making tanks an effective way to store surface water for irrigation during dry periods.

127. Mention two advantages of rainwater harvesting.

Ans : MAIN 2008

(i) Utilizes water effectively, reducing flood risks from runoff, preventing erosion, and minimizing contamination of surface water by pesticides, sediments, metals, and fertilizers.
(ii) Provides a clean water source for landscape irrigation, free from chemicals like fluoride and chlorine, as well as dissolved salts and minerals.

128. (i) What is rainwater harvesting?
(ii) Mention two objectives of rainwater harvesting.

Ans : SQP 2012

(i) Rainwater harvesting is the process of collecting and storing rainwater from surfaces such as rooftops, roads, or open grounds for later use, typically to meet water needs for domestic, agricultural, or industrial purposes.
(ii) Two objectives of rainwater harvesting :
  (a) To conserve water by capturing rainwater and reducing dependence on external water sources.
  (b) To recharge groundwater and improve water availability in areas with water scarcity.

129. Why is per capita availability of water getting decline?

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116. Most of the South Indian states are not suitable for development of canal irrigation.

Ans : SQP 2019

(i) South Indian states have uneven terrain, making it difficult to construct and maintain canal irrigation systems.
(ii) Rivers in South India are seasonal and have limited perennial water flow, reducing the feasibility of canal irrigation.

117. Mention any two suitable conditions for well irrigation.

Ans : COMP 2016, 2015

(i) **High Water Table :** The area must have an elevated water table to ensure ample water availability.
(ii) Affordable Power for Water Lifting: Access to inexpensive power sources is essential for efficiently pumping water from wells.

118. State two reasons why tank irrigation is popular in South India.

Ans : COMP 2017, 2016, 2014, 2012

(i) The Deccan Plateau features an undulating landscape with hard rock formations, making the digging of canals and wells challenging.
(ii) The plateau's hard rock structure restricts the percolation of rainwater, resulting in limited availability of groundwater resources.

119. (i) What are the main sources of irrigation used in the country ?
(ii) Mention any two states in each case where the source mentioned by you dominates.

Ans : SQP 2013

(i) Main sources of irrigation are Wells, Canals, Tanks.
(ii) (a) Wells : Uttar Pradesh and Bihar.
(b) Canals : Punjab and Uttar Pradesh.
(c) Tanks : Tamil Nadu and Andhra Pradesh

120. Why canal irrigation is widespread in Northern India ?

Ans : MAIN 2017

(i) Low relief area.
(ii) Even surface so digging is easy.
(iii) Perennial.

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121. Why the inundation canals converted to perennial canals ?

Ans : SQP 2012

Inundation canals are directly sourced from rivers without the construction of any barrage. They primarily provide irrigation during the rainy season and cover smaller areas. In contrast, perennial canals maintain a continuous flow of water throughout the year. These canals are built by constructing a barrage across the river, allowing them to irrigate larger areas. Consequently, inundation canals are converted into perennial canals to ensure year-round irrigation.

122. (i) Name two states where perennial canals are widely used.
(ii) Briefly explain two reasons for perennial canals being a popular form of irrigation in the named states.

Ans : MAIN 2013

(i) Punjab and Haryana
(ii) Perennial canals are popular in Punjab and Haryana because :
(a) Reliable Water Supply : Rivers like the Sutlej and Beas ensure a year-round water source.
(b) Flat Terrain : The plains allow easy construction and water distribution.

123. 'The Northern plain of India is found suitable for canal irrigation' Give reason.

Ans : SQP 2016

Canal irrigation is appropriate for Northern India due to the following reasons :
(i) Low-Relief Landscape : The region features gently sloping terrain.
(ii) Flat Terrain : The even surface facilitates easy excavation of canals.
(iii) Deep, Fertile Soils : The rich, deep soils help offset the construction costs of canals by supporting productive agriculture.

TWO MARKS QUESTIONS

109. Mention one advantage and one disadvantage of using tank irrigation.

Ans : MAIN 2024

One advantage and one disadvantage of using tank irrigation :

(i) **Advantage :** Tank irrigation helps in storing rainwater, making it available for use during dry periods, especially in areas with uneven rainfall.

(ii) **Disadvantage :** Tanks often occupy large areas of land, reducing the space available for agriculture and other activities.

110. Distinguish between Inundation canal and Perennial canal.

Ans : MAIN 2023

Distinguish between Inundation Canal and Perennial Canal :

Inundation Canal	Perennial Canal
Draws water directly from rivers during floods.	Supplied with water from rivers or reservoirs through dams or barrages.
Available only during the flood season.	Provides a consistent water supply throughout the year.
Dependent on seasonal river flow.	Independent of seasonal changes, ensuring year-round irrigation.

111. Give a reason for each of the following:

(i) Agriculture sector in India needs the support of irrigation.

(ii) Well irrigation is a popular means of irrigation in Northern India.

Ans : COMP 2023

(i) Irrigation is essential in Indian agriculture due to the irregular distribution of rainfall and seasonal nature of the monsoon, ensuring crops receive water consistently.

(ii) In Northern India, well irrigation is common because of the high water table and fertile alluvial soil, which allows easy access to groundwater.

112. Give two ways in which Rainwater Harvesting is important for India.

Ans : MAIN 2023

Two ways in which Rainwater Harvesting is important for India:

(i) Reduces dependency on groundwater : Helps in replenishing groundwater levels, which are depleting in many parts of the country.

(ii) Mitigates water scarcity : Provides a sustainable water source in areas facing irregular or insufficient rainfall, especially during dry seasons.

113. Why is there need for irrigation in India?

Ans : MAIN 2019, 2018, 2016, 2015,

(i) Unpredictable Rainfall: Rainfall patterns in India are highly erratic and uncertain.

(ii) Uneven Rainfall Distribution: Rainfall is not uniformly spread across the country, leading to disparities in water availability.

(iii) Varied Water Requirements for Crops: Different types of crops cultivated in India have distinct water needs.

(iv) Short Monsoon Season: The rainy season is brief, with approximately 80% of the annual rainfall occurring between June and September.

114. What is Rainwater Harvesting?

Ans : COMP 2023

Rainwater Harvesting is the practice of collecting and storing rainwater from rooftops, land surfaces, or other catchment areas for future use, especially for irrigation, domestic purposes, or groundwater recharge.

115. What is rainwater harvesting ?

Ans : COMP 2018, 2016

It is a method of enhancing groundwater recharge by collecting and storing rainwater through the construction of structures such as percolation pits and check dams.

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Ans : SQP 2000

The per capita availability of water is decreasing due to rapid industrialization and urbanization, which place significant pressure on existing water resources. Therefore, it is essential to conserve water.

130. Give two main reasons why water scarcity occurs in India.

Ans : COMP 2016

(i) Over-extraction and Mismanagement : Excessive use of groundwater for agriculture and inefficient water management practices lead to depletion of water resources.
(ii) Uneven Distribution of Rainfall : India experiences seasonal and uneven rainfall, with some regions receiving excessive rain and others facing prolonged droughts, contributing to water shortages.

131. (i) Name three traditional means of irrigation.
(ii) Give a reason why traditional means of irrigation are still important in most parts of India.

Ans : MAIN 2010

(i) The three traditional means of irrigation are :
(a) Basin Irrigation
(b) Strip Irrigation
(c) Furrow Irrigation
(ii) Traditional means of irrigation are still important because they are cost-effective, easily accessible for small-scale farmers, and suitable for regions with limited infrastructure for modern irrigation systems.

132. What is meant by the term 'water scarcity' ? What has caused this scarcity in India ?

Ans : MAIN 2020

Scarcity refers to a state of being limited or in short supply, and water scarcity specifically indicates a shortage of water, highlighting an imbalance between demand and supply, particularly regarding potable water.

In India, water scarcity arises from both natural and human-made factors. Key contributors to this issue include poor resource management, insufficient government attention, and human-induced pollution.

133. Mention two factors which are essential for the development of tube well irrigation.

Ans : COMP 2006

(i) High Water Table : A sufficient quantity of groundwater must be available for tube wells to function effectively.
(ii) Reliable Power Supply : A steady and affordable source of electricity or diesel is needed to operate the pumps used for extracting water.

134. Name two states in which tube wells are extensively used. Give a reason to explain its importance as a source of irrigation.

Ans : SQP 2014

Uttar Pradesh and Punjab states has extensive use of tubewells. Tube wells are crucial in these states because they provide a reliable source of groundwater for irrigation, especially in regions where canal irrigation is limited, ensuring year-round water availability for water-intensive crops like wheat and rice.

135. "Without irrigation, development of agriculture is difficult in India." Clarify the statement by giving two reasons.

Ans : COMP 2011

"Without irrigation, development of agriculture is difficult in India" because of :
(i) The spatial and temporal variation of monsoon rainfall is not uniform across different locations.
(ii) Rainfall levels fluctuate annually, with some years experiencing good rainfall while others may have significantly less.

136. There is plenty of rain in India during the rainy season, yet we need irrigation. Give two reasons to support this statement.

Ans : MAIN 2007

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48. Mention one advantage of using tank as a means of irrigation.

Ans : MAIN 2023

Tank irrigation help in water conservation, as rainwater is stored and used during dry periods, making it useful in regions with irregular rainfall.

49. What is surface water ?

Ans : COMP 2019

Water that is on the earth's surface such as streams, rivers, lakes or reservoir, etc.

50. What do you understand by the term 'water resource' ?

Ans : MAIN 2020

The term 'water resource' refers to any of the entire range of natural waters that occur on the earth and are of potential use to living beings.

51. What are inundation canals ?

Ans : SQP 2019

The canals which are drawn directly from the rivers without making any kind of barrage or dam at their head to regulate the flow of the river and canal.

52. What is rooftop rainwater harvesting ?

Ans : COMP 2019

It is a technique through which rainwater is collected from the roof catchments and stored in reservoirs.

53. Name any two states where rooftop water harvesting is most common.

Ans : MAIN 2018

Meghalaya and Rajasthan.

54. State one measure the Government should adopt to handle the present water crisis.

Ans : SQP 2015

Government should promote rainwater harvesting.
Drip, sprinkle and other water saving techniques for irrigation should be promoted.

55. Name any two states where this is used to conserve water.

Ans : COMP 2004

This method is used in Rajasthan and Karnataka.

56. Name two modern methods of irrigation. State one important reason for their growing popularity.

Ans : MAIN 2015

Drip irrigation and sprinkler system. These are water saving techniques.

57. What is meant by the term irrigation ?

Ans : SQP 2002

Irrigation refers to the process of watering of agricultural plants through artificial means from wells, tanks, tube-wells, canals; etc.

58. What percentage of the earth's surface is covered with water ?

Ans : COMP 2006

About 3/4.

59. Name any two states where well is the main source of irrigation.

Ans : MAIN 2011, 2017

Punjab and Uttar Pradesh.

60. How is freshwater obtained ?

Ans : MAIN 2010

The freshwater is obtained from precipitation, surface run off and groundwater that is continually being renewed and recharged through the hydrological cycle.

61. How is freshwater being renewed ?

Ans : SQP 2014

The freshwater is being renewed through the hydrological cycle.

62. Mention any two regions which are expected to face water shortage.

Ans : COMP 2018

(i) Regions having low rainfall.
(ii) Regions which are drought prone.

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144. Mention two advantages that surface wells have over inundation canals.

Ans : SQP 2016

(i) They are the most straightforward and cost-effective irrigation method, while inundation canals require significant investment.
(ii) Wells offer year-round irrigation, whereas inundation canals supply water only during the rainy season.

145. From which river the following canal draws water?
(i) Upper Bari Doab Canal
(ii) Sirhind Canal

Ans : MAIN 2002

(i) Upper Bari Doab Canal draws water from the Ravi River.
(ii) Sirhind Canal draws water from the Satluj River.

146. Mention the major objective of the Narmada Bachao Andolan.

Ans : MAIN 2014

The major objective of the Narmada Bachao Andolan was to stop the construction of large dams, particularly the Sardar Sarovar Dam on the Narmada River, and to advocate for the rights of the people displaced by the project. The movement aimed to protect the environment and ensure proper rehabilitation and compensation for the affected communities, including tribal people and farmers.

147. (i) Mention any two regions which are expected to face water shortage.
(ii) Mention any three freshwater resources.

Ans : SQP 2018

(i) (a) Rajasthan : Due to its arid climate and low rainfall.
(b) Punjab : Due to over-extraction of groundwater for intensive agriculture.
(ii) Precipitation, surface run off and groundwater.

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148. "Need of the hour is to conserve and manage our water resources." Mention any four reasons.

Ans : SQP 2022

(i) To protect against health risks.
(ii) To ensure food security.
(iii) To prevent the degradation of our natural ecosystem.
(iv) To safeguard future generations from water scarcity.

149. Name two techniques of rooftop rainwater harvesting.

Ans : SQP 2006

(i) Recharge through hand pump.
(ii) Recharge through abandoned dugwell.

150. Tank irrigation is appropriate in Deccan Plateau. Justify by giving two reasons.

Ans : COMP 2020

(i) Groundwater is limited in quantity.
(ii) The hard rock terrain makes canal excavation challenging.

151. What is the need of rainwater harvesting ?

Ans : COMP 2010

(i) To address the issue of water scarcity.
(ii) It is an environmentally friendly method.
(iii) It is cost-effective.

152. How has irrigation changed the cropping pattern?

Ans : COMP 2001

Irrigation has enabled the cultivation of water-intensive crops like rice and sugarcane in areas with insufficient rainfall. It allows for multiple cropping, improving agricultural productivity throughout the year. Additionally, it has expanded farming into arid regions and increased the production of cash crops.

153. (i) What is meant by rainwater harvesting ?
(ii) State any two methods of rainwater harvesting ?

Ans : MAIN 2023

(iii) Drip irrigation greatly minimizes water loss through evaporation by precisely delivering water directly to the plant roots in a slow, carefully regulated manner, utilizing an intricate system of pipes, valves, and tubing.

184. (i) Name any two states where well irrigation is practised.
(ii) Give one advantage and one disadvantage of tubewell irrigation.

Ans : COMP 2016

(i) Two states where well irrigation is practiced are:
  (a) Uttar Pradesh
  (b) Punjab
(ii) Advatage and disadvantage of tubewell irrigation :
  (a) Advantage : Tubewell irrigation provides a reliable and continuous water supply, especially in areas with a high water table, allowing for year-round irrigation.
  (a) Disadvantage : Tubewell irrigation can lead to groundwater depletion if overused, especially in regions where the water table is already low.

185. Give a geographical reason for each of the following :
(i) Canals make the soil infertile.
(ii) Tubewell irrigation is quite expensive.
(iii) Excessive accumulation of salts make the soils unsuitable for cultivation.

Ans : MAIN 2020

(i) In canal irrigation, when the water table is only a few feet below the surface, alkaline salts can rise to the surface, mix with the soil, and render it unproductive.
(ii) This method is costly as it relies on a continuous supply of electricity.
(iii) Large areas of arid and semi-arid land in India have been abandoned for cultivation due to salt accumulation. Excessive irrigation and inadequate water management have led to waterlogging and a gradual buildup of salts. This progressive increase in soil salinity has made the land unsuitable for agricultural use.

186. (i) Name two states in which tubewells are extensively used.
(ii) State why tubewell irrigation is important in Punjab.

Ans : SQP 20002

(i) Uttar Pradesh and Bihar.
(ii) Tubewell irrigation is crucial in Punjab due to the following factors :
  (a) Access to abundant groundwater at significant depths.
  (b) Flat terrain and soft soil, making it suitable for tubewell installation.
  (c) A vast fertile area that can be effectively irrigated.
  (d) Consistent availability of affordable electricity to operate the tubewells.

187. (i) What is watershed management ?
(ii) How is it beneficial reason for each of the following

Ans : MAIN 2010

(i) Watershed Management : Watershed management entails the efficient conservation and administration of both surface and groundwater resources. It aims to reduce runoff and increase groundwater replenishment through techniques such as percolation pits, recharge wells, borewells, and dugwells.The Central Government has launched a watershed development initiative named 'Haryali.' This program is designed to empower rural communities to preserve water for diverse applications, including irrigation, drinking, fisheries, and afforestation.
(ii) Significance of Watershed Management:
  (a) Watersheds play a vital role in supplying drinking water, offering recreational activities, and enhancing the aesthetic appeal of an area. However, the replacement of natural vegetation with impermeable surfaces such as roads and rooftops negatively impacts watershed health. This

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159. Mention two disadvantages of tank irrigation.

Ans : MAIN 2020

(i) Tanks accumulate silt quickly, requiring frequent desilting to remain effective for irrigation.
(ii) When the monsoons are inadequate, tanks dry up, making them an unreliable source of irrigation.

160. Why is drip irrigation called 'trickle irrigation'? Give its two advantages.

Ans : SQP 2002

Drip irrigation, often referred to as "trickle irrigation," involves a steady dripping of water rather than a rapid flow. Its two main advantages are :
(i) The consistent drip minimizes water wastage.
(ii) Water is delivered directly to the roots of plants or trees, promoting efficient absorption.

161. What are the factors of water scarcity?

Ans : COMP 2006

The factors contributing to water scarcity are:
(i) Industrialisation and urbanisation increase water demand.
(ii) Poor water management leads to wastage.
(iii) Waste disposal pollutes water sources.
(iv) Lowered water table from over-extraction.

162. Write down the different regional names of rainwater harvesting in India.

Ans : MAIN 2010

The various names for rainwater harvesting in India are as follows:
(i) Johads (small earthen dams) and Kunds (covered underground tanks) in Rajasthan.
(ii) Tankas (small underground tanks) and Khadin (embankments used to store runoff water) in Gujarat.
(iii) Cheruvu (reservoirs) in Andhra Pradesh.
(iv) Dongs (ponds) used by the Bodo tribes in Assam.
(v) Kere (tanks) in Karnataka.

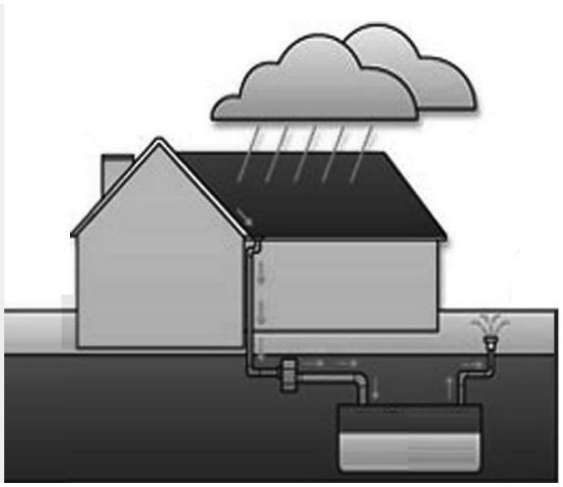
THREE MARKS QUESTIONS

163. Give a reason to explain each of the following:
(i) Sprinkler irrigation is gaining popularity in recent times.
(ii) Tube well irrigation is used in Punjab.
(iii) North India has more area under canal irrigation.

Ans : MAIN 2023

(i) Sprinkler irrigation is gaining popularity because it allows for efficient water distribution, reducing water wastage and ensuring even coverage, which is particularly useful in areas with limited water resources.
(ii) Punjab relies heavily on groundwater for irrigation, making wells a crucial irrigation source. They can cover large areas in a relatively short time and provide year-round irrigation.
(iii) Northern India's soil is permeable, and the groundwater level is high, allowing for the efficient development of canal irrigation systems in the region.

164. (i) Name the water conservation practice shown in the above picture.



(ii) How does this system help to reduce floods?
(iii) Why is water conservation necessary? (Any two reasons)

Ans : MAIN 2024

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(i) The water conservation practice shown in the image is rainwater harvesting.
(ii) This system helps reduce floods by collecting and storing rainwater, which reduces surface runoff and prevents excessive water accumulation in drainage systems during heavy rainfall.
(iii) Water conservation is necessary because :
(a) Climate change is causing a decline in groundwater levels, leading to limited water availability. To address this, conserving water is essential to help replenish groundwater and mitigate water shortages when levels drop significantly.
(b) As the population continues to grow rapidly, water sources are diminishing. To prevent water scarcity, we must conserve as much water as possible and ensure its availability for future generations.

165. What is water scarcity? Mention any four factors responsible for water scarcity.

Ans : SQP 2018, 2015, 2013

Water scarcity refers to the shortage or insufficient availability of water resources to meet the demands of a population, agriculture, or industry.
Four factors responsible for water scarcity:
(i) Rapid population growth : Increases demand for water for domestic, agricultural, and industrial uses.
(ii) Over-extraction of groundwater : Excessive withdrawal of groundwater depletes reserves faster than they can be replenished.
(iii) Pollution of water bodies : Industrial waste, agricultural runoff, and untreated sewage contaminate rivers and lakes, reducing usable water.
(iv) Climate change : Altered weather patterns, such as droughts and reduced rainfall, affect the availability of freshwater.

166. Why is there a need to conserve water resources ?

Ans : COMP 2019, 2010

(i) Importance of Water for Life : Water is essential for life on Earth. It is believed that life initially emerged in water before migrating to land. In fact, water is a fundamental prerequisite for the existence of life.
(ii) Water's Role in Agriculture : The cultivation of crops relies heavily on the availability of water. Water dissolves minerals and other nutrients present in the soil, allowing plant roots to absorb these vital nutrients. As India is predominantly an agricultural nation, the presence of sufficient water is crucial for its farming activities.
(iii) Water's Importance in Industry : Water plays a critical role in the industrial sector, primarily serving as a cooling agent to regulate temperatures during various manufacturing processes.
(iv) Water for Domestic Use : Water is also vital for drinking and other domestic needs. With increasing urbanization and the adoption of modern lifestyles, the demand for water continues to rise steadily each day.

167. (i) What is a tube-well ?
(ii) Mention any three geographical conditions favoring its installation.

Ans : COMP. 2015

(i) A tube-well is a deep well, typically over 15 meters in depth, from which water is extracted using a pumping system powered by an electric or diesel motor. It is capable of providing water for irrigation more efficiently than traditional wells.
(ii) Three geographical conditions favoringinstallation of tube-well
(a) Abundant Groundwater Supply : There should be a sufficient quantity of groundwater available, as a tube-well can irrigate around 2 hectares per day, compared to just 0.2 hectares per day with a traditional well.
(b) Shallow Water Table : The water table should be around 15 meters deep. If the water level exceeds 50 meters,

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the cost of pumping water from such depths becomes economically unfeasible.

(c) Reliable Power Supply : A steady and affordable supply of electricity or diesel is essential to ensure that water can be pumped out of the tube-well as needed, especially during peak irrigation times.

168. Why there is need for rainwaters harvesting ?

or

Mention two objectives of rainwater harvesting.

Ans : MAIN 2016, 2015

(i) To address the shortfall of surface water in meeting our needs.
(ii) To prevent the decline of groundwater levels.
(iii) To boost groundwater availability.
(iv) To enhance the infiltration of rainwater into the subsoil.
(v) To improve groundwater quality through dilution.
(vi) To boost agricultural production.

169. Answer the following questions in about 120 words :

(i) Discuss how is rainwater harvesting in semi-arid regions of Rajasthan carried out.
(ii) Describe how are modern adaptations of traditional rainwater harvesting methods being carried out to conserve and store water.

Ans : COMP 2011

(i) In the semi-arid regions of Rajasthan, traditional methods of rainwater harvesting like Johads, Kunds, and Khadins are widely practiced. Johads are small earthen check dams that capture and store rainwater, while Kunds are underground tanks used to store rainwater for drinking and irrigation. Khadins involve embankments built to trap surface runoff, allowing it to infiltrate the soil, which helps in growing crops. These methods are well-suited to the local terrain and climate, where rainfall is scarce and erratic. By storing water during the monsoon season, these structures provide a critical water source during dry periods, helping to recharge groundwater and sustain agriculture.

(ii) Modern adaptations of traditional rainwater harvesting methods integrate new technologies to enhance water conservation. Rooftop Rainwater Harvesting (RTRWH) systems are a key adaptation, where rainwater from rooftops is collected in storage tanks and used for domestic purposes. Additionally, structures like recharge pits and trenches are built to allow rainwater to seep into the ground, replenishing groundwater levels. Modern filtration systems are often added to these methods to remove impurities and make the water more suitable for consumption. These systems are now equipped with first-flush mechanisms to discard the initial rainwater, which may contain contaminants from rooftops. By combining traditional practices with modern technology, water storage has become more efficient, helping to meet the demands of growing populations and erratic rainfall patterns.

170. Write down the advantages of rainwater harvesting.

Ans : SQP 2018, 2012

Advantages of Rainwater Harvesting :

(i) Reduces flooding : Captures rainwater, reducing flood risks and soil erosion.
(ii) Addresses water scarcity : Provides an additional water source during dry periods.
(iii) Recharges groundwater : Helps replenish groundwater levels and aquifers.
(iv) Cost-effective : Lowers expenses on external water sources and infrastructure.
(v) Eco-friendly : Conserves water resources and protects local ecosystems.

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171. Mention two factors that favour the development of tube well irrigation in Punjab.

Ans : MAIN 2019

(i) High Water Table : Punjab has a relatively high water table, making it easier and more economical to access groundwater for irrigation through tube wells.

(ii) Availability of Cheap Electricity : The state has a well-developed infrastructure for electricity supply, ensuring a reliable and affordable power source for operating tube well pumps.

172. (i) Give a reason for the significance of irrigation in :
  (i) Punjab
  (ii) Rajasthan

(ii) Name a state where :
  (i) Tube wells are common
  (ii) Tank irrigation is popular

(iii) Give one Geographical reason for each of the following :
  (i) Sprinkler irrigation is practised in arid and semi-arid regions.
  (ii) A tube well should be installed in a fertile and productive region.

Ans : COMP 2017

(i) (a) **Punjab :** Rainfall is inconsistent, varying year by year and across different locations. The Rabi crop requires water during the winter. This region has a strong agricultural base and features fertile plains. Due to limited winter rain, irrigation is essential.

(b) **Rajasthan :** In West Rajasthan, rainfall is below 25 cm, making irrigation necessary.

(ii) (a) Tube wells are prevalent in Uttar Pradesh, Bihar, Punjab, Haryana, Rajasthan, and West Bengal.

(b) Tank irrigation is commonly practiced in Tamil Nadu, Andhra Pradesh, Telangana, and Karnataka.

(iii) (a) Sprinkler irrigation is utilized in arid and semi-arid areas because it minimizes water loss by delivering water through pipes. Given the scarcity of water in these regions, this method is economical and promotes water conservation by providing uniform distribution.

(b) Tube wells should be installed in fertile and productive areas to ensure that the costs of construction and operation are recouped through increased agricultural output.

173. (i) What is meant by rainwater harvesting ?

(ii) Mention any two rainwater harvesting systems practiced in India.

Ans : COMP 2018

(i) Water harvesting involves the direct collection of rainwater, which can be stored for immediate use or recharged into groundwater. In different regions, it is referred to as Khatri or Kuhl in the Western Himalayas, Boalis or Dighis in the Gangetic plains, Johads in Central India, Korambu in the Eastern Ghats, and Zing in Ladakh.

(ii) Rainwater harvesting in India is achieved through the following methods :

(a) Catchments : Areas designed to collect and channel rainwater for storage or recharge.

(b) Rooftop Rainwater Harvesting : Collecting rainwater from rooftops and directing it into storage tanks or recharge systems.

(c) Check Dams : Small barriers built across streams or watercourses to slow down water flow, allowing it to percolate into the ground and recharge groundwater.

174. What are the disadvantages and advantages of tube-wells.

Ans : SQP 2013 , 2012, 2011

(i) Disadvantages of tube-wells :

(a) **Dependence on Cheap Power :** Tube-wells require affordable electricity, which is not readily available in many states.

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(b) **High Groundwater Extraction Costs :** Farmers bear the expense of groundwater extraction, making it costly.
(c) Lowering of Water Table : Over-extraction of groundwater has significantly reduced water levels in several states.

(ii) Advantages of tube-wells :
(a) Reliable Irrigation Source : Tube-wells provide a dependable source of irrigation.
(b) Easy Installation : They can be dug quickly and with relative ease.

175. Give a geographical reason for each of the following :
(i) Need to adopt different means of irrigation.
(ii) Need for conserving water.
(iii) Man is responsible for water crisis in India.

Ans : SQP 2014

(i) Adopting various irrigation methods is essential for ensuring sustained agricultural productivity and overall development.
(ii) (a) Excessive extraction of groundwater frequently leads to a significant drop in the water table.
(b) Water is a fundamental resource for agriculture; a shortage of water would reduce food production, causing scarcity of essential goods.
(c) To prevent a water crisis for future generations.
(iii) Over-extraction of groundwater, pollution of water bodies, deforestation, and poor water management practices by humans have led to severe water shortages and declining water quality across the country.

176. Give three reasons for conservation of water resources.

Ans : MAIN 2022

(i) Health Protection : Conservation helps mitigate health risks associated with contaminated water, which is often polluted by urban waste, industrial effluents, and agricultural chemicals.
(ii) Groundwater Preservation : Over-exploitation of groundwater has led to a decline in water tables, making conservation necessary to restore balance.
(iii) Future Generations : Saving potable water ensures that future generations have access to clean and safe drinking water.

177. Differentiate between Surface water and Ground water.

Ans : MAIN 2018

Aspect	Surface Water	Groundwater
Definition	Water found on the Earth's surface in lakes, rivers, and reservoirs.	Water stored beneath the Earth's surface in aquifers.
Source	Rainfall, melting snow, and surface runoff.	Infiltration of rainwater and surface water through soil and rock layers.
Location	Easily accessible, located in visible bodies.	Hidden from view, found deep underground.
Quality	Often affected by pollution, sediment, and temperature changes.	Typically cleaner but can be contaminated by surface pollutants.
Usage	Commonly used for irrigation, recreation, and drinking water.	Primarily used for drinking, irrigation, and industrial purposes.

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(i) Rainwater harvesting refers to the process of collecting and storing rainwater for future use, typically from rooftops, land surfaces, or other catchment areas, to conserve water and reduce reliance on traditional water sources.

(ii) Two methods of rainwater harvesting are :
   (a) Surface runoff harvesting : Collecting and storing rainwater from surfaces like roads, fields, and other land areas to prevent water wastage and utilize it for agriculture or groundwater recharge.
   (b) Rooftop rainwater harvesting: Capturing rainwater from rooftops and channeling it into storage tanks or recharge systems for future use.

154. Why is water harvesting needed ?

Ans : SQP 2012

Water harvesting is essential for conserving and managing our precious water resources. It involves capturing and storing rainwater for future use, reducing the strain on traditional water sources like rivers and groundwater. This method also helps in recharging groundwater levels, which are depleting due to over-extraction. By providing a reliable water supply during dry seasons, water harvesting mitigates the effects of drought and water scarcity. Additionally, it aids in controlling floods and preventing soil erosion by reducing surface runoff.

155. What is 'drip irrigation' ? How is it useful ?

Ans : SQP 2000

Drip irrigation is the most advanced and efficient method of watering crops, particularly fruits and vegetables. This system uses perforated pipes placed between crop rows or buried along the root lines, delivering water directly to the plants. This significantly reduces evaporation and conserves irrigation water. Additionally, drip irrigation enables growers to tailor their irrigation schedules to meet the specific needs of each crop.

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156. Explain briefly the need to conserve water.

Ans : COMP 2004

Water conservation is crucial for several reasons:

(i) Overexploitation of groundwater often leads to a decline in the water table.

(ii) Loss of vegetation contributes to drought and decreases both rainfall and the water table.

(iii) Irrigation accounts for over 90 percent of total freshwater usage.

(iv) By 2025, the demand for industrial water is expected to surpass the demand for domestic water by more than double.

(v) Population growth over time exacerbates water scarcity.

(vi) Our water resources, such as groundwater, rivers, and lakes, are polluted, making them unsuitable for use without significant treatment.

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157. What is meant by furrow irrigation ? What is its advantage?

Ans : MAIN 2008

Furrow irrigation is a form of flood irrigation where water is directed to flow through narrow channels dug between crop rows, rather than distributing it evenly across the entire field. To ensure uniform water distribution, the furrows must have consistent dimensions. This method is particularly effective in regions where water is readily available.

158. Where are tanks most widely used in India ? Why?

Ans : COMP 2016

Tanks are most widely used in South India, particularly in states like Tamil Nadu, Karnataka, and Andhra Pradesh because of the following reasons :

(i) The Deccan Plateau is extensively fragmented, featuring numerous natural depressions.

(ii) The Deccan Plateau is deeply cut with natural depressions.

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capture and utilize available water resources.

(b) The extensive hard and rocky terrain of the Indian plateau makes the construction of wells and canals difficult, making tank irrigation the most practical alternative.

(c) Tank irrigation is crucial for storing excess rainwater that would otherwise be lost to runoff and go to waste.

(iii) Groundwater reserves are depleting rapidly due to several factors :

(a) Population Growth : A rising population increases water demand for domestic use, putting additional pressure on groundwater sources.

(b) Intensified Irrigation : Expanded agricultural irrigation leads to excessive groundwater extraction to support farming activities.

(c) Industrialization : Growing industries consume more water for various processes, further draining groundwater reserves.

181. (i) What type of regions are expected to face water shortage?

(ii) In which areas rainwater harvesting is used?

(iii) Name regions where these rainwater harvesting techniques are used.

(a) Dongs

(b) Cheruva

Ans : SQP 2000

(i) Arid and semi-arid regions, areas with erratic rainfall, overpopulated regions, and regions with depleting groundwater levels are most likely to face water shortages.

(ii) Rainwater harvesting is used in the states of Rajasthan, Gujarat, Andhra Pradesh, Assam and Karnataka.

(iii) (a) Dongs : Used by the Bodo tribes in Assam.

(b) Cheruva : Practiced in Andhra Pradesh.

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182. Mention any three water harvesting systems practiced in India.

Ans : COMP 2004

The three water harvesting systems practiced in India are:

(i) Rooftop Rainwater Harvesting : This method involves collecting rainwater where it falls, using the roof as a catchment area. The rainwater is gathered from the rooftop of buildings and stored for later use.

(ii) Kuls : In hilly and mountainous regions, people construct diversion channels known as 'guls' or 'kuls'. These are commonly found in the Western Himalayas and are primarily used for irrigation.

(iii) Johads and Khadins : In arid and semi-arid regions, agricultural fields are transformed into rain-fed storage structures, which allow water to percolate and moisten the soil. This system is referred to as 'khadins' in Jaisalmer and 'Johads' in other parts of Rajasthan.

183. Give a geographical reason for each of the following :

(i) Well irrigation is confined mainly to the alluvial plains.

(ii) In Tamil Nadu, nearly one-third of the net irrigated area is under canal irrigation.

(iii) Drip irrigation reduces loss of water through evaporation.

Ans : SQP 2012

(i) Well irrigation is primarily practiced in alluvial plains because the soft soil allows for easy digging of wells and supports high agricultural productivity. Wells are typically located centrally and on higher ground within fields, while the presence of perennial rivers helps sustain groundwater levels.

(ii) Tamil Nadu receives the majority of its rainfall during the winter, leaving the summer months dry. As a result, canal irrigation becomes crucial for providing water during the dry season and compensating for the lack of rainfall in the summer.

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178. (i) Differentiate between surface water and groundwater.
(ii) Mention two reasons to explain as to why we are facing water scarcity in recent times.

Ans : SQP 2001

(i) Diference between surface water and ground water :

Aspect	Surface Water	Groundwater
Source	Found on the surface (rivers, lakes).	Located beneath the Earth's surface (aquifers).
Availability	Seasonal and depends on rainfall.	Available year-round but replenishes slowly.
Usage	Used for large-scale irrigation and drinking.	Extracted for irrigation, domestic use, and industries.

(ii) We are facing water scarcity in recent times due to following reasons :
(a) Over-extraction of groundwater : Excessive use of groundwater for irrigation, industry, and domestic purposes has led to the depletion of aquifers.
(b) Climate change : Irregular rainfall patterns, prolonged droughts, and increasing temperatures have reduced the availability of freshwater resources.

179. (i) Name two methods of water harvesting in India.
(ii) Mention any two objectives of rainwater harvesting.

Ans : COMP 2023

(i) The two methods of water harvesting in India are:
(a) Rooftop rainwater harvesting.
(b) Recharge of groundwater.

(ii) The two objectives of rainwater harvesting are:
(a) To capture rainwater and prevent it from flowing away, thereby reducing soil erosion and flooding in nearby areas.
(b) To fulfill water demands during dry seasons.

180. Give a geographical reason for each of the following :
(i) Inundation canals are being converted to perennial canals.
(ii) Tank irrigation is preferred over other means of irrigation in Peninsular India.
(iii) Groundwater reserves are depleting at a fast rate.

Ans : MAIN 2008

(i) Inundation canals are being converted to perennial canals for several reasons:
(a) Inundation canals take water directly from rivers without using regulating systems like weirs, while perennial canals ensure a steady water supply throughout the year.
(b) Inundation canals depend on seasonal flooding and provide water only during the rainy season, whereas perennial canals offer a continuous water flow all year round.
(c) These canals often dry up during drought periods.
(d) Inundation canals are unlined, leading to water seepage into nearby areas, which can result in the formation of swamps, unlike perennial canals.
(e) Without a regulatory system at their head, inundation canals cannot efficiently irrigate higher elevation areas, making perennial canals more suitable for diverse irrigation needs.

(ii) Tank irrigation is preferred over other irrigation methods in Peninsular India for several reasons:
(a) The region's uneven and rocky plateau, combined with irregular rainfall, allows tank irrigation to effectively

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alteration leads to increased runoff speed and volume, which in turn causes soil erosion, higher turbidity levels in water bodies, and the degradation of wildlife habitats.

(a) Forested regions are essential for the well-being of watersheds. The canopy cover and layer of leaf litter help absorb moisture, preserving soil structure. Additionally, the root systems of trees improve soil permeability and stability, facilitating effective moisture storage.

188. Give a geographical reason for each of the following :

(i) Many farmers in India still use wells.

(ii) There is very little recharge of groundwater.

(iii) The traditional wells dry up.

Ans : COMP 2006

(i) Wells are a convenient and cost-effective source of water for small-scale irrigation, especially in regions with accessible groundwater, making them a preferred method for many farmers.

(ii) Due to factors like deforestation, urbanization, and over-extraction of groundwater, there is reduced infiltration of rainwater into the ground, leading to limited recharge of groundwater reserves.

(iii) Excessive extraction of groundwater through tubewells and borewells lowers the water table, causing traditional shallow wells to run dry, particularly in times of drought or inadequate rainfall.

189. Give a geographical reason for each of the following :

(i) Modern means of irrigation are gaining popularity.

(ii) Sprinkler irrigation helps in conserving water.

(iii) Spray irrigation is quite expensive.

Ans : SQP 2014

(i) Modern irrigation techniques are perfect for conserving water, as they reduce wastage and improve efficiency, minimizing water loss.

(ii) Sprinkler irrigation supplies water directly to crops in a regulated way, reducing evaporation and runoff, thus minimizing water wastage and conserving water resources.

(iii) Spray irrigation requires the installation of specialized equipment such as pipes, pumps, and sprinkler heads, and its operation depends on a reliable power supply, making the system costly to set up and maintain.

190. Differentiate between modern methods of irrigation and traditional methods of irrigation.

Ans : MAIN 2022

Aspect	**Modern Methods of Irrigation**	**Traditional Methods of Irrigation**
Water Efficiency	High water efficiency, minimal wastage	Low water efficiency, significant wastage
Cost	Higher setup cost due to advanced equipment	Lower initial cost but higher long-term wastage
Water Distribution	Controlled distribution directly to plant roots	Uneven distribution, over- or under-irrigation
Technology	Uses pumps, pipes, sprinklers	Relies on manual labor and simple tools
Water Conservation	Minimizes evaporation and runoff	High water loss due to evaporation and seepage

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Bagiaburu and Bonai in Kendujhar and Sundergarh, respectively.

2. **Karnataka :** Ranked second, with important mines at Donai Malai in the Bellary-Hospet region, Bababudan in Chikmagalur, and Kudreinlikh in Chitradurga.
3. **Chhattisgarh :** Third in production, featuring significant mines at Dalli Rajhara in Durg and Bailadilla in Bastar.
4. **Jharkhand :** Fourth in production, with mines located at Noamundi, Singhbhum, and Hazaribagh.

4. MANGANESE

Manganese is a hard, black metal that occurs as natural oxides. It is primarily used in the steel industry as a key raw material for ferro-manganese alloys, as well as in dry batteries and dye manufacturing.

4.1 Uses

1. **Alloys :** Enhances the quality of iron and steel; approximately 10 kg of manganese is used for every tonne of steel produced.
2. **Industrial Applications :** Used in manufacturing bleaching powder and insecticides.
3. **Specialty Alloys :** Creates ferro-manganese alloys for specific properties.
4. **Glass Manufacturing :** Employed in producing colored glass.
5. **Batteries :** Used in dry cell batteries.

4.2 Distribution

India is the seventh-largest producer of manganese ore, following China, South Africa, Australia, Brazil, Gabon, and Kazakhstan. Key producing states include:

1. **Madhya Pradesh :** Major production in Balaghat and Chhindwara districts.
2. **Maharashtra :** Notable belts in Nagpur and Bhandara, with high-grade ore in Ratnagiri.
3. **Odisha :** Manganese sourced from Gondite deposits in Sundergarh and Keonjhar, as well as Khondolite deposits in Kalahandi and Koraput.
4. **Andhra Pradesh :** Main production between Srikakulam and Visakhapatnam, with other districts including Vijayanagaram, Cuddapah, and Guntur.

5. COPPER

Copper, often referred to as "the red metal," is a non-ferrous base metal that occurs naturally in a usable metallic form. It is malleable, ductile, and has a wide range of applications, including in space programs, railways, and telecommunications.

5.1 Uses

1. **Electrical Industry :** Predominantly used in copper wires and various electrical equipment.
2. **Meteorology :** Utilized in rain gauges.
3. **Heat Conductor :** Effective in refrigeration, cooking utensils, and electrical wires due to its excellent heat conductivity.
4. **Aerospace and Telecommunications :** Essential in space programs and communication systems.

5.2 Distribution

India accounts for about 3.4% of global copper production. Major copper-producing states include:

1. **Jharkhand :** Notable reserves in Singbhum and Hazaribagh.
2. **Madhya Pradesh :** Home to the Malanjkhand copper belt, with significant reserves in Balaghat, making it the largest copper-producing state in India.
3. **Rajasthan :** Key regions include the Khetri copper belt, along with important deposits in Singhana and Udaipur.

6. BAUXITE

Bauxite is the primary ore of aluminum, predominantly found in tertiary deposits and associated with laterite rocks. It is commonly located in the plateau regions, hilly areas of peninsular India, and coastal tracts.

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CHAPTER 8

MINERAL RESOURCES

SUMMARY

1. MINERALS

A mineral is a combination of two or more elements with a definite chemical composition, formed through inorganic processes. Typically found in the Earth's crust as ore, minerals serve various purposes after being processed. Their potential value is realized once they are extracted and refined.

2. TYPES OF MINERALS

Minerals are classified into three forms: metallic minerals, non-metallic minerals, and energy minerals.

(i) **Metallic Minerals :** Found in igneous rocks, these minerals contain metals and are crucial for industrialization and economic development. Examples include iron ore, manganese, bauxite, nickel, copper, and gold.

(ii) **Non-Metallic Minerals :** Also referred to as fossil fuels, these minerals are significant energy sources. Key examples include coal, petroleum, and natural gas.

3. IRON ORE

Haematite and magnetite are the highest quality iron ores, containing 50% to 70% iron. Iron is a key indicator of a country's economic growth, and there are four main types of iron ore found in India:

(i) **Magnetite ('Blado Ore') :** Known for its high quality, magnetite has about 70% iron content and strong magnetic properties, earning it the nickname 'black iron.' It is sourced from Andhra Pradesh, Goa, Tamil Nadu, and Karnataka.

(ii) **Hematite :** The second-best quality iron ore, containing 50% to 60% iron, is referred to as 'oxide of iron.' Major production areas include Andhra Pradesh, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, Goa, Karnataka, and Maharashtra.

(iii) **Limonite :** Also called 'hydrated iron oxide,' limonite is of inferior quality, containing 40% to 60% iron. It typically appears yellow or brown and is found in Raniganj (West Bengal), Uttar Pradesh, Uttarakhand, and Himachal Pradesh.

(iv) **Siderite :** Known as 'iron carbonate,' siderite has a low iron content of 10% to 40% and contains various impurities.

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3.1 Uses of Iron Ore

1. **Iron and Steel Industries :** Approximately 90% of iron ore is utilized in these industries for extraction and processing, contributing to construction, automobiles, railways, and machinery.
2. **Pigments :** Iron ore is used in polishing compounds, medicines, and magnetic inks.
3. **Sponge Iron Production :** Low-grade iron ore is transformed into sponge iron, which is then converted into pellets and exported.

3.2 Distribution

India holds about 20% of the world's iron ore reserves, primarily found in peninsular regions. The key iron ore-producing states are:

1. **Odisha :** The leading producer, with major mines at Gorumahisani, Sulaipat, and Badampahar in Mayurbhanj, and

61. Bauxite is an oxide of which metal ? Where are the deposits of Bauxite found in India?

Ans : MAIN 2013

Bauxite, an oxide of aluminum, is primarily found in Odisha (Kalahandi, Koraput), Jharkhand (Ranchi, Lohardaga), Chhattisgarh (Surguja, Bastar), Madhya Pradesh (Katni) and Maharashtra (Kolhapur).

62. What is the importance of iron ?

Ans : SQP 2015

(i) Steel production : It is the main raw material for steel, crucial for construction, infrastructure and manufacturing.
(ii) Manufacturing : Used in machinery, tools, vehicles and appliances.
(iii) Construction : Essential for building bridges, buildings and structures.
(iv) Economy : Supports industrial growth and creates jobs.

63. Name three important States which form the tertiary coal distribution chain.

Ans : MAIN 2007

Tamil Nadu, Rajasthan and Gujarat are three key states that comprise the tertiary segment of the coal distribution chain.

64. State why Jharkhand State in known for its coal fields.

Ans : SQP 2009

Jharkhand is renowned for its coal fields, with about 50% of India's total coal production coming from the Jharia mines. Other significant coal mines in Jharkhand are located in Bokaro, Giridih, North Karanpura and South Karanpura.

65. Is India rich in coal ? If yes, describe India's situation and places, where we can found coal ?

Ans : COMP 2005

Yes, India is rich in coal, holding the fourth-largest reserves globally and supplying around 70% of its energy needs. Major coal-producing areas include Jharkhand (Jharia, Bokaro), Chhattisgarh (Korba), Odisha (Talcher, Ib Valley), West Bengal (Raniganj) and Madhya Pradesh (Singrauli, Sohagpur).

66. Distinguish between Anthracite and Lignite coal.

Ans : COMP 2017

Anthracite	Lignite
This is the best quality coal containing about 80% carbon.	It is a lower grade coal containing about 60% carbon.
It has the highest heating value.	It has the low hearting value.

67. State two uses of aluminium.

Ans : COMP 2011

(i) It is utilized in the manufacture of pots, pans and automobile components.
(ii) It is employed in the production of electrical wires.

THREE MARKS QUESTIONS

68. Write any three uses of manganese.

or

State any two important industrial use of manganese.

Ans : SQP 2010, 2017, 2017

(i) It is utilized in the production of iron, steel and their alloys.
(ii) It enhances the strength of steel.
(iii) It is employed in the manufacturing of paints, glass, chemicals and more.

69. Name the states in which the following mines are located :
(i) Singhbhum Copper mine
(ii) Khetri copper mine
(iii) Kudermukh iron ore mine

Ans : MAIN 2012

(i) Singhbum copper mine - Jharkhand
(ii) Khetri - Rajasthan
(iii) Kudermukh - Karnataka

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6.1 Uses

1. **Aluminum Production :** Extracted as hydrated aluminum oxides, which are used to produce aluminum.
2. **Lightweight Applications :** Aluminum's light weight and rust resistance make it ideal for manufacturing aircraft, ships, and utensils.
3. **Electrical Industry :** Its good conductivity makes it useful in electrical applications.

6.2 Distribution

India ranks as the 5th largest producer of bauxite globally. Major producing states include:

1. **Odisha :** The largest producer, with key districts including Kalahandi, Balangir, Koraput, Sundergarh, and Sambalpur.
2. **Gujarat :** The second-largest producer, with significant districts such as Jamnagar, Sabarkantha, Kutch, and Surat.
3. **Jharkhand :** Third in production, mainly from Ranchi, Palamu, Lohardaga, and Singhbhum districts.
4. **Chhattisgarh :** Important areas include Surguja, Durg, Rajgarh, Bilaspur, and Jashpur districts.
5. **Maharashtra :** Bauxite mining began later here, initially in Thane, now also in Kolaba, Ratnagiri, and Kolhapur districts.
6. **Madhya Pradesh :** Key areas include the Amarkantak plateau in Shandol, along with Mandla, Balaghat, and Katni in Jabalpur.
7. **Other Producers :** Significant deposits are found in Karnataka (Belgaum district) and Tamil Nadu (Nilgiris, Madurai districts).

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MULTIPLE CHOICE QUESTION

1. Bauxite is the ore of :
(a) Aluminium
(b) Copper
(c) Manganese
(d) Iron

Ans : MAIN 2024

Thus (a) is correct option

2. Copper is alloyed with Zinc to form :
(a) Stainless steel
(b) Brass
(c) Bronze
(d) Aluminium

Ans : MAIN 2023

Thus (b) is correct option

3. Minerals are natural substances having definite chemicals and_____properties.
(a) Chemical
(b) Physical
(c) Biological
(d) Both (a) and (b)

Ans : MAIN 2000

Thus (b) is correct option

4. _____ Mineral is used to regulate blood sugar levels and to support the immune system.
(a) Manganese
(b) Iron ore
(c) Mica
(d) Copper

Ans : MAIN 2022

Thus (a) is correct option

5. _____ is a ferrous mineral.
(a) Copper
(b) Bauxite
(b) Iron ore
(d) Coal

Ans : SQP 2002

Thus (c) is correct option

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6. Good quality minerals are _____ in quantity than low quality minerals.
(a) Equal
(b) Lesser
(c) Higher
(d) Poorer

Ans : COMP 2004

Thus (b) is correct option

7. _____ is one of the most widely distributed minerals found in the earth's crust.
(a) Iron ore
(b) Copper
(d) Coal
(d) Limestone

Ans : MAIN 2004

Thus (a) is correct option

8. Which ore of iron is reddish in colour?
(a) Magnetite
(b) Hematite
(c) Limonite
(d) All of the above.

Ans : SQP 2006

Thus (b) is correct option

9. _____ is also known as 'Black ore'.
(a) Limonite
(b) Hematite
(c) Magnetite
(d) None of the above

Ans : COMP 2008

Thus (c) is correct option

10. The main iron ore exporting ports in India are Mormugao and _____.
(a) Paradip
(b) Haldia
(c) Visakhapatnam
(d) Kandla

Ans : COMP 2014

Thus (b) is correct option

11. _____ is the best quality of iron that contains more than 70 per cent of iron.
(a) Magnetite (b) Limonite
(c) Hematite (d) Ironite

Ans : MAIN 2010

Thus (a) is correct option

12. About 90 per cent of iron ore is used to make _____.
(a) Bauxite
(b) Steel
(c) Brass
(d) Bronze

Ans : SQP 2012

Thus (b) is correct option

13. _____ is a raw material used for smelting of iron ore.
(a) Manganese
(b) Magnetite
(c) Mica
(d) Feronite

Ans : MAIN 2016

Thus (a) is correct option

14. Manganese is used to make resistant to rusint
(a) Copper
(b) Bronze
(c) Bauxite
(d) Steel

Ans : SQP 2018

Thus (d) is correct option

15. _____ is used in dry cell batteries.
(a) iron ore
(b) Manganese
(c) Copper
(d) Bauxite

Ans : COMP 2020

Thus (b) is correct option

16. An excess of _____ in plants and animals is toxic.
(a) Iron ore
(b) Magnetite
(c) Manganese
(d) Hematite

Ans : SQP 2001

Thus (c) is correct option

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17. _____ is essential for plant growth and reduction of nitrates in green plants.
(a) Mica
(b) Iron
(c) Manganese
(d) Copper

Ans : COMP 2003

Thus (c) is correct option

18. _____ is the earliest metal used by man.
(a) Iron (b) Manganese
(c) Bauxite (d) Copper

Ans : MAIN 2005

Thus (d) is correct option

19. Which of the following is a principal combination in which copper occurs in nature?
(a) Sulphides
(b) Oxides
(c) Carbonate
(d) All of the above

Ans : SQP 2007

Thus (d) is correct option

20. _____ is a good conductor of electricity, highly malleable and ductile.
(a) Copper (b) Iron
(c) Bauxite (d) Mica

Ans : COMP 2009

Thus (a) is correct option

21. Copper is alloyed with _____ and nickle to make stainless steel.
(a) Zinc (b) Tin
(c) Iron (d) Brass

Ans : MAIN 2011

Thus (c) is correct option

22. Copper is alloyed with _____ to make bronze.
(a) Iron (b) Tin
(c) Nickle (d) Zinc

Ans : SQP 2013

Thus (c) is correct option

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ONE MARK QUESTIONS

23. Name any three varieties of coal produced in India.

Ans : MAIN 2024

Three varieties of coal produced in India are Anthracite, Bituminous, Lignite.

24. Name the variety of coal widely used in Iron and Steel Industries of India.

Ans : COMP 2024

The variety of coal widely used in the Iron and Steel Industries of India is Bituminous coal.

25. Name the state that is the largest producer of iron ore in India.

Ans : SQP 2024

The largest producer of iron ore in India is Odisha.

26. Name any one mining area of Iron ore from the state mentioned by you.

Ans : MAIN 2024

One mining area of iron ore from Odisha is the Keonjhar district.

27. Name the state of India that leads in the production of Manganese.

Ans : COMP 2023

Odisha.

28. Name two states where coal is mined in abundance.

Ans : MAIN 2023

Jharkhand, Chhattisgarh.

29. Name the mineral that toughens steel and makes it rust proof.

Ans : SQP 2018

Manganese.

30. What is the importance of Manganese for the Iron and Steel industry ?

Ans : SQP 2023

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Manganese is crucial for steelmaking as it improves strength, removes impurities and enhances durability.

31. Which two districts of Chhattisgarh are the leading producers of iron ore ?

Ans : COMP 2008

Baster and Durg.

32. Name different types of iron ore found in India.

Ans : MAIN 2009

(i) Magnetite
(ii) Hematite.

33. Name one area in Odisha and one area in Chhattisgarh where iron ore is mined.

Ans : COMP 2008

Odisha - Sundargarh
Chhattisgarh - Bailadila in Bastar district.

34. Name any two states which are the leading producers of manganese.

Ans : COMP 2014, 2012

Odisha and Madhya Pradesh.

35. Copper is used in power cables". Give reasons.

Ans : MAIN 2019

Because it is a good conductor of electricity.

36. Name the best quality of iron ore.

Ans : COMP 2015

Magnetite

37. Name two states where it is found

Ans : MAIN 2017

Tamil Nadu and Karnataka

38. Name two main coal bearing areas of India.

Ans : SQP 2019

West Bengal - Raniganj, Jharkhand - Jharia.

39. State any one disadvantage of coal found in India ?

Ans : MAIN 2000

Calorific value of coal found in India is low.

40. Name any two iron ores.

Ans : MAIN 2012

(i) Hematite
(ii) Magnetite.

41. Name the largest producer of iron ore in India.

Ans : SQP 2014

Odisha.

42. Name any four major minerals of India.

Ans : COMP 2010

Iron, manganese, bauxite and copper.

43. Name any four centres of iron in Odisha.

Ans : COMP 2016

Sundargarh, Mayurbhanj, Cuttack and Koraput.

44. Name the two important centres of iron ore in Jharkhand.

Ans : MAIN 2018

Singhbhum and Palamau.

45. Name any two countries to which iron ore from India is exported.

Ans : SQP 2020

Japan, Korea, European and Gulf countries.

TWO MARKS QUESTIONS

46. Which is the best quality iron ore ? Mention its two characteristics.

Ans : SQP 2016, 2009

Magnetite.
(i) It contains more than 70% of iron.
(ii) It has excellent magnetic qualities.

47. Name the following :
(i) An off-shore oil field of India.
(ii) An iron ore mine of Karnataka.

Ans : COMP 2016

(i) Mumbai-High

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(ii) Bababudan Hills

48. Name the following :
(i) An iron ore mine of Karnataka.
(ii) Name best variety of iron ore.

Ans : SQP 2016

(i) Bababudan Hills.
(ii) Magnetite.

49. Give the names of four important types of iron ore found in India.

Ans : COMP 2017

(i) Magnetite
(ii) Hematite
(iii) Limonite
(iv) Siderite

50. What is lignite ? Name any two areas where lignite is found in India.

Ans : MAIN 2011

Lignite is a lower quality coal containing about 60% of carbon. It is also known as brown coal. Areas :
(i) Nevali : Tamil Nadu
(ii) Palna : Rajasthan

51. Name the coalfield that is oldest and one that is largest in India.

Ans : COMP 2021

Gondwana coalfield is oldest and Tertiary coalfield is largest.

52. What type of mineral is copper ? Name any two states where copper is found in India.

Ans : SQP 2003

It is a highly valuable industrial metal renowned for its excellent electrical conductivity, exceptional ductility and malleability, making it ideal for manufacturing electric wires and a variety of other equipment.Copper is a non-ferrous metallic mineral found primarily in Rajasthan and Jharkhand.

53. Why does India have to import oil ?

Ans : MAIN 2011

India is deficient in Petroleum, so India have to import oil.

54. Name one important area that has large coal deposits in the States of Jharkhand and West Bengal.

Ans : SQP 2005

Jharia coalfield in Jharkhand ; Raniganj coalfield in West Bengal.

55. Name one refinery which belongs to the private sector and one in the public sector.

Ans : SQP 2002

Jamnagar refinery belongs to the private sector.
Guwahati refinery (Assam) belongs to the public sector.

56. What are the two types of minerals ?

Ans : COMP 2004

(i) Metallic minerals.
(ii) Non-metallic minerals.

57. What are metallic minerals ?

Ans : MAIN 2006

Minerals from which we get metals are called metallic minerals, e.g., ores of iron, gold, copper, lead, tin.

58. What are non-metallic minerals ?

Ans : SQP 2008

These are those minerals which do not contain metals, e.g., coal, petroleum, mica, manganese.

59. A mineral X is used for making iron and steel. It increases the strength of steel. Identify the mineral. Which country of South Asia is the leading producer of that mineral ?

Ans : COMP 2022

Mineral X is manganese. India is the leading producer of manganese.

60. What is an ore ?

Ans : MAIN 2001

A naturally occurring deposit which contains a mineral or minerals in sufficient concentration to justify commercial exploitation, e.g., Bauxite is ore of Aluminium.

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CASE BASED QUESTION

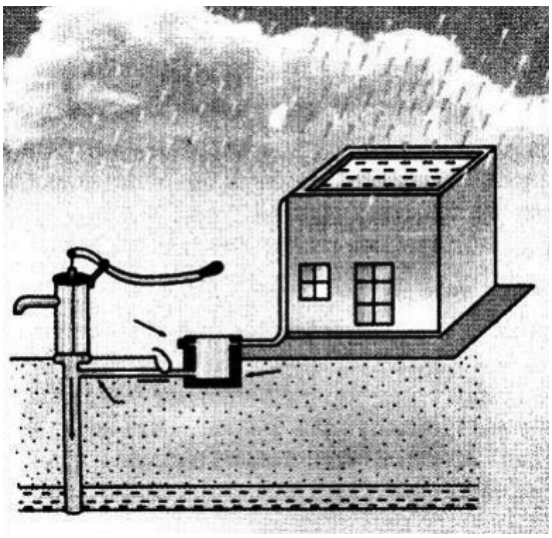
191. Study the diagram below and answer the questions that follow.

(i) What does the picture shows?
(ii) What can be done in this regard?

Ans : MAIN 2023

(i) The image highlights the importance of conserving the precious water on Earth.
(ii) We can take several measures to save water, such as:
  (a) Recycling and reusing water.
  (b) Implementing rainwater harvesting systems to prevent run off.

192. Study the diagram below and answer the questions that follow.



(i) Name the activity shown in the diagram.
(ii) Give two objectives of the activity.

Ans : COMP 2001

(i) The diagram illustrates the rooftop rainwater harvesting method.
(ii) Two objectives of rainwater harvesting are:
  (a) To provide a straightforward solution for replenishing groundwater and raising its levels.
  (b) To maximize the utilization of rainwater and minimize runoff or wastage.

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70. With reference to manganese answer the following questions :
(i) Which state is the leading producer in India?
(ii) Name its largest buyer.
(iii) Why its exports are constantly decreasing ?

Ans : COMP 2012

(i) Odisha is the leading producer of manganese in India.
(ii) Japan is the largest buyer of manganese from india.
(iii) The exports of manganese from India are constantly decreasing due to the growing domestic demand for manganese in the steel and manufacturing industries, limiting the amount available for export. Additionally, restrictions on mining and environmental concerns have also contributed to the decline in exports.

71. Give a geographical reason for each of the following :
(i) Many port cities have their own oil refineries.
(ii) Petroleum is called a 'fossil fuel'.
(iii) Coal is called a versatile mineral.

Ans : MAIN 2015

(i) Many port cities have their own oil refineries because crude oil is imported from other countries and refineries located at port cities reduce transportation costs by refining the oil close to the point of import. This ensures quick access to raw materials and facilitates efficient distribution of refined products.
(ii) Petroleum is called a 'fossil fuel' because it is formed from the remains of ancient marine plants and animals that were buried under layers of sediment millions of years ago. Over time, heat and pressure transformed these organic materials into petroleum.
(iii) Coal is called a versatile mineral because it can be used in various industries, including electricity generation, steel production, cement manufacturing and as a raw material for chemical products like fertilizers and plastics. Its diverse applications make it a highly valuable resour

72. With reference to iron ore in India, answer the following questions :
(i) What grade of iron is mostly mined in India? Name the states that lead in the production of iron ore.
(ii) Importance of iron ore for Indian industry.
(iii) How is the low grade iron ore utilized?

Ans : SQP 2012

(i) High-grade hematite iron ore (60% to 70% iron content).
Leading states : Odisha, Chhattisgarh, Karnataka, Jharkhand.
(ii) Iron ore is vital for the steel industry, supporting construction, infrastructure and manufacturing. It also boosts exports.
(iii) Low-grade iron ore is upgraded through beneficiation and used in steelmaking, sponge iron production and the cement industry.

73. With reference to copper answer the following questions :
(i) Any three uses of copper.
(ii) Any two states which are the leading producer of copper.
(iii) Electric industry is the major consumer of copper. Give reason.

Ans : COMP 2022, 2018

(i) Uses of copper :
(a) Electrical wiring and cables due to its excellent conductivity.
(b) Manufacture of electronics and telecommunications equipment.
(c) Production of alloys such as brass and bronze.
(ii) Rajasthan and Madhya Pradesh.
(iii) Copper has high electrical conductivity, making it ideal for electrical wiring, transformers and other electrical components, as it efficiently transmits electricity with minimal energy loss.

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14. What is the difference between Metallic and Non-metallic minerals ?

Ans : COMP 2023

Aspect	Metallic Minerals	Non-metallic Minerals
Composition	Contain metals in their raw form	Do not contain metals
Examples	Iron, Copper, Gold	Limestone, Mica, Coal
Appearance	Shiny with metallic luster	Dull, non-metallic appearance
Conductivity	Good conductors of heat and electricity	Poor conductors of heat and electricity
Extraction	Extracted for industrial metal use	Used in industries like construction and energy
Uses	For metals, tools, machinery and electronics	For building materials, energy and manufacturing

15. Name the three varieties of Iron Ore mined in India. Name one each state where each is found ?

Ans : MAIN 2019

Three varieties of Iron ore found in India are :

(i) **Hematite :** Known for its reddish color and often referred to as "Red Ore," haematite contains between 60% to 70% pure iron. It is predominantly found in the states of Odisha, Jharkhand, Chhattisgarh, Karnataka and Maharashtra.

(ii) **Magnetite :** This ore is characterized by its dark brown to blackish hue, earning it the name "Black Ore." Magnetite is considered the highest quality iron ore, boasting over 70% iron content. Its magnetic properties are the reason behind its name. It is primarily located in Tamil Nadu and Karnataka.

(iii) **Limonite :** Exhibiting a yellow or light brown color, limonite contains approximately 35% to 50% iron. It is part of the iron stone group found in the Raniganj coalfield and is also present in regions such as Garhwal (Uttarakhand), the Mirzapur district (Uttar Pradesh) and the Kangra Valley (Himachal Pradesh).

16. What is a mineral ? State two characteristics of minerals.

Ans : SQP 2021

Minerals are naturally occurring substances of either organic or inorganic origin, characterized by specific chemical and physical properties.

Characteristics of Minerals :

(i) Uneven Distribution : Minerals are not uniformly spread across different geographical areas.

(ii) Inverse Quality - Quantity Relationship : High-quality minerals are typically found in smaller quantities, whereas lower-quality minerals are more abundant.

(iii) Exhaustible Resources : Minerals are finite and deplete over time. They require long geological periods to form and cannot be replenished quickly to meet immediate demands.

17. Give a reason for each of the following :

(i) Manganese is an important raw material in the iron and steel industry.

(ii) Bauxite is used in electrical equipment industry

(iii) Raw iron needs to be alloyed in order to be useful in construction and automobile industry.

Ans : MAIN 2011

(i) Manganese is used as an alloy to strengthen steel, improve its toughness and increase its resistance to wear and corrosion. Manganese also helps in the removal of oxygen and sulfur impurities during steel production.

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(ii) it is the primary ore of aluminum, which is lightweight, highly conductive and resistant to corrosion. These properties make aluminum ideal for use in electrical wiring and components.

(iii) Pure iron does not possess the strength and hardness required for construction and other applications. To enhance its durability, it is alloyed with other elements, thereby strengthening and hardening it. This improved material is then utilized in construction, automobiles and various forms of transportation, including trucks, trains and train tracks.

78. (i) Which state is the largest producer of mineral oil ?

(ii) Mention any two advantages of hydel power.

Ans : SQP 2002

(i) Assam State

(ii) Advantages of Hydroelectric Power:

(a) Clean and Non-Polluting : Hydroelectric energy is an environmentally friendly source that does not contaminate the air or water, as it does not generate harmful waste or poisonous by-products.

(b) Renewable Energy Source : Hydroelectric power is sustainable and can be harnessed repeatedly without depleting resources.

79. Give a reason for each of the following:

(i) Magnetite is so called.

(ii) Copper is used for making electric wires.

(iii) Aluminium is used for makingaircraft.

Ans : COMP 2004

(i) Magnetite is so called because it exhibits natural magnetic properties, making it one of the most magnetic minerals on Earth.

(ii) Because it has excellent electrical conductivity, allowing electricity to flow efficiently with minimal energy loss. Copper is also ductile and resistant to corrosion, making it ideal for electrical wiring.

(iii) Because it is lightweight, strong and resistant to corrosion. These properties make it suitable for reducing the overall weight of the aircraft while maintaining structural strength and fuel efficiency.

80. (i) Name two characteristics of Iron Ore deposits in India that facilitate their optimum use in the iron and steel plants.

(ii) Name two industries that require Iron Ore as raw material.

Ans : MAIN 2006

(i) (a) Powdered iron is utilized in the production of metallurgical products, magnets, high-frequency cores, automotive components and catalysts.

(b) Radioactive iron, comprising 59 percent iron, is employed in the medical field as a tracer element and is also used in biochemical and metallurgical research.

(ii) Construction and Automobiles Industries

81. Name the major iron ore belts of India with one important characteristic of each.

Ans : SQP 2008

The major iron ore belts in India are :

(i) **Odisha - Jharkhand Belt :** This region stands as India's top iron ore producer. In Odisha, high-grade haematite ore is extracted from the Badampahar mines located in the Mayurbhanj and Kendujhar districts. Meanwhile, the Palamau and Singhbhum districts in Jharkhand are significant sources of haematite iron ore.

(ii) **Durg - Bastar - Chandrapur Belt :** Situated across Chhattisgarh and Maharashtra, this belt is renowned for its high-grade haematite found in the well-known Bailadila hill range within Chhattisgarh's Bastar district. The ore from this region is exported to Japan and South Korea through the Vishakhapatnam port.

(iii) **Bellary - Chitradurga - Chikmagalur-Tumkur Belt :** Located in Karnataka, this belt boasts substantial iron ore reserves. The Kudremukh mines in the Western Ghats of Karnataka operate as

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Thus (a) is correct option

16. _____is the first refinery in the private sector in India.
(a) The Reliance Petroleum Ltd.
(b) The Vadinar Oil Refinery
(c) Bina Oil Refinery
(d) Panipat Oil Refinery

Ans : COMP 2004

Thus (a) is correct option

17. Most of the non-conventional sources of energy are _____.
(a) Exhaustible
(b) Inexhaustible
(c) Polluting
(d) Expensive

Ans : MAIN 2006

Thus (b) is correct option

18. India has higher amount of solar energy because of India's location on the _____.
(a) Tropic of Cancer
(b) Tropic of Capricorn
(c) Poles
(d) Equator

Ans : SQP 2008

Thus (a) is correct option

19. Most parts of India have _____ clear sunny days in a year.
(a) 365 (b) 350
(c) 300 (d) 200

Ans : COMP 2010

Thus (c) is correct option

20. Solar cells are known as _____ cells.
(a) Super (b) Photonic
(c) Photovoltaic (d) Solaratic

Ans : MAIN 2012

Thus (c) is correct option

21. Solar energy is used to _____ water in regions with limited clean water suplies.
(a) Boil (b) Freeze
(c) Condense (d) Distill

Ans : SQP 2014

Thus (d) is correct option

22. Wind power accounts for _____ per cent of India's total installed power generation capacity.
(a) 10
(b) 20
(c) 25
(d) 40

Ans : COMP 2016

Thus (a) is correct option

23. Tidal energy can be harnesed at _____ .
(a) Gulf of Kutch
(b) Sundarbans
(c) Andaman and Nicobar Islands
(d) All of the above

Ans : MAIN 2022

Thus (d) is correct option

24. Geothermal energy is independent of _____ and season.
(a) Time
(b) Atmosphere
(c) Weather
(d) Winds

Ans : SQP 2018

Thus (c) is correct option

25. The process of splitting of radioactive substances is called _____ .
(a) Nuclear fission
(b) Nuclear fusion
(c) Nuclear reaction
(d) Nuclear bombing

Ans : COMP 2015

Thus (a) is correct option

26. Nuclear power is the _____ largest source of electricity in India.
(a) Second
(b) Fourth
(c) Fifth
(d) Sixth

Ans : SQP 2014

Thus (c) is correct option

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CHAPTER 9

ENERGY RESOURCES

SUMMARY

1. CONVENTIONAL SOURCES OF ENERGY

These include coal, petroleum, natural gas and hydel power. Except for hydel, they are expensive and limited. Coal and petroleum, as fossil fuels, cause air pollution and contribute to global warming. Despite these issues, they are widely used in many industries.

2. COAL

India is the third-largest coal producer globally. Coal, a fossil fuel from sedimentary rocks, is a conventional and combustible energy source. High-quality coal is mainly produced in Bihar and West Bengal. The four primary types of coal are peat, lignite, bituminous and anthracite.

2.1 Distribution

Coal distribution in India is concentrated in seven key states, each playing a vital role in the nation's coal reserves. Jharkhand has the largest reserves, featuring major coalfields like Jharia and Bokaro. Odisha ranks second with significant coalfields in the Mahanadi basin, such as Talcher and Rampur. Chhattisgarh is third, home to important coalfields like Korba and Bishrampur. In West Bengal, the Raniganj coalfield is the second largest in India, alongside the newly discovered Mejia coalfield. Madhya Pradesh is the fourth largest producer, with key mines in Singrauli and Pench Valley. Andhra Pradesh holds the fifth position, while Maharashtra is sixth, particularly in the Nagpur-Wardha region. These states not only meet domestic energy demands but also support India's coal exports to countries including Bangladesh, Sri Lanka, Pakistan, Myanmar, Japan, Hong Kong and Malaysia.

2.2 Advantage

Advantages of coal are as follows:

1. It is easy to burn
2. It produces high energy upon its combustion.
3. It is available in an abundant supply.
4. It is safer as compared to nuclear energy.

2.3 Disadvantages

Disadvantages of coal are as follows:

1. Its mining activity is dangerous for mining workers.
2. Due to its mining, deforestation, land degradation take place and also habitats of wildlife get affected.
4. It is a non-renewable source.

3. PETROLEUM

The word 'petroleum' is derived from the Latin terms 'petra' (rock) and 'oleum' (oil), meaning 'rock oil'. It is a key source for products such as kerosene, diesel, paraffin wax, vaseline and benzene. Petroleum is of organic origin and is found in sedimentary basins, shallow depressions and marine areas. Crude petroleum, also known as 'mineral oil', is a mixture of hydrocarbons in solid, liquid and gaseous forms. India has limited petroleum resources and ranks 24th in global production.

3.1 Distribution

1. North Eastern Region

(i) **Assam :** Home to the oldest oil field, Digboi, along with Naharkatiya, Moran,

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Generation

Water penetrates the Earth's crust through cracks, heating up and turning into steam. This steam drives turbines connected to generators, producing electricity. Geothermal energy is used both for electricity generation and direct applications. In India, two experimental projects harness this energy:

1. Puga Valley, Ladakh
2. Parvati Valley, Himachal Pradesh

Advantages

1. Renewable : Sustainable energy source.
2. Eco-Friendly : Minimal environmental impact.
3. Cost-Effective : Inexpensive and widely accessible.

6.5 Nuclear Power

Nuclear power is India's fourth largest source of electricity, developed in August 1956. India is one of six countries with established nuclear power stations.

Generation

Nuclear energy is produced in controlled reactors through the splitting of uranium or thorium atoms. This process releases heat, which generates steam to drive turbines and produce electricity.

Advantages of Nuclear Energy

1. Cost-Effective : More economical than thermal power plants.
2. Efficient Fuel Use : No issues with fuel transportation, storage, or handling.
3. Low Manpower : Requires fewer workers to operate.
4. Compact : Takes up less space compared to thermal plants.

6.6 Biogas

Biogas is produced through the anaerobic decomposition of organic materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste and food waste. As a renewable energy source, biogas is utilized for heating, electricity generation and various other applications.

Advantages of Biogas :

1. Eco-Friendly : Minimizes environmental impact.
2. Pollution Reduction : Decreases soil and water contamination.
3. Organic Fertilizer : Produces natural fertilizers.

MULTIPLE CHOICE QUESTION

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Identify the source of energy that leads to pollution:
(a) Tidal energy
(b) Wind energy
(c) Natural gas
(d) Geo-thermal energy

Ans : MAIN 2024

Thus (b) is correct option

2. Hirakud dam is based on which of the following rivers?
(a) River Godavari
(b) River Mahanadi
(c) River Krishna
(d) River Narmada

Ans : COMP 2024

Thus (b) is correct option

3. Which types of resources of energy are coal, petroleum and natural gas?
(a) Conventional sources
(b) Non-renewable sources
(c) Non-conventional sources
(d) Both (a) and (b)

Ans : SQP 2023

Thus (d) is correct option

4. _____is the oldest coalfield in India.
(a) Raniganj
(b) Jharia
(c) Korba
(d) Singrauli

Ans : SQP 2013

Thus (a) is correct option

Major Dams :

1. Bhakra Nangal Dam:

(i) Location : Punjab, Rajasthan, Himachal Pradesh on the Sutlej and Beas rivers.

(ii) Features: 226 meters high, 518 meters long.

(iii) Functions : Flood control, irrigation, electricity generation and tourism through Gobind Sagar Lake.

2. Hirakud Dam

(i) Location : Mahanadi River, Odisha.

(ii) Features : Longest major earthen dam in India.

(iii) Functions : Flood control, irrigates 75,000 km^2, generates electricity with two powerhouses and supports industries via three canals.

6. NON-CONVENTIONAL SOURCES OF ENERGY

Renewable energy sources are naturally replenished by elements like sunlight, water, tides, wind and air. Unlike non-renewable sources, which are limited and can be completely exhausted, renewable energy offers an abundant and sustainable supply. Below are the primary non-conventional energy sources:

6.1 Solar Energy

Solar energy is harnessed from sunlight and is a key part of India's energy portfolio, with a solar grid capacity of 15.60 GW. It is generated using:

1. Electric Collectors : Convert sunlight into heat for fluids.
2. Photovoltaic Cells : Generate electricity for lighting.
3. Solar Cookers : Trap heat for cooking and heating.
4. Solar Heaters : Heat water for domestic use.

Advantages

1. Renewable : Infinite and sustainable.
2. Cost-Effective : High returns on initial investment.
3. Versatile : Used for heating, cooking, drying and electricity.
4. Eco-Friendly : Reduces fossil fuel dependence and emissions.

6.2 Wind Energy

Wind energy is generated using wind turbines and windmills to produce power for heating and lighting. Fluctuating wind speeds can impact power generation.

Generation :

India's wind power capacity has surged to 32.72 GW, making it the fourth largest globally. Windmills are primarily installed in open, coastal and hilly areas, especially in the South-West and North regions.

Advantages :

1. Cost-Effective : Economical to produce.
2. Clean Energy : Environmentally friendly.
3. Abundant and Domestic: Inexhaustible and locally available.
4. Sustainable : Long-term energy solution.
5. Low Operational Costs: Minimal maintenance expenses.

6.3 Tidal Energy

India's 7,500 km coastline, especially Gujarat's Gulf of Cambay and Gulf of Kutch, is ideal for tidal power. Tides drive turbines to generate inexpensive, renewable and pollution-free electricity.

Generation :

Floodgate dams trap water during high tide. When the tide recedes, the water flows back through turbines via pipes, producing electricity.

Advantages :

1. Clean and Safe : Environmentally friendly.
2. Simple Process : Easy to implement.
3. High Capacity : Generates significant power.
4. Efficient : More efficient than solar or wind energy.

6.4 Geothermal Energy

Geothermal energy is derived from the Earth's internal heat and is a vast, clean power resource.

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Galeki, Rudrasagar and Hugrijan in the Upper Assam or Naharkatiya-Moran region.

(ii) **Arunachal Pradesh :** Hosts the Nigru oil field in Tirap district.

(iii) **Nagaland :** Contains the Borholla oil field near the Assam-Nagaland border.

2. Western Region

(i) Located in the Khambhat basin, Gujarat plain and Mumbai coast.

(ii) Key oil fields in Gujarat include Ankleshwar, Kalol, Navagam, Sanand and Lunej.

3. East Coastal Region

(i) Situated in the Krishna, Godavari and Kaveri basins.

(ii) Maharashtra is the largest petroleum-producing state in India.

(iii) Despite its limited reserves, petroleum remains a vital energy source for India's industries and economy.

3.2 Advantages of Petroleum

1. Primary Energy Source : Second only to coal in India's energy supply.
2. Easy Transportation : Can be efficiently moved via pipelines or tankers.
3. Clean Combustion : Produces no ash when burned.
4. Industrial Support : Essential for petrochemical, fertilizer and chemical industries.
5. Versatile Fuels : Includes ethane, gasoline, kerosene and LPG.

3.3 Disadvantages of Petroleum

1. Environmental Pollution : Burning releases significant CO_2, contributing to global warming.
2. Non-Renewable : Finite resource that is depleting.
3. Toxicity : Harmful to humans, animals and plants.
4. High Costs : Expensive extraction and processing require substantial investment.

4. NATURAL GAS

Natural gas is a naturally occurring hydrocarbon gas mixture, primarily composed of methane. It is a toxic, colorless and odorless fossil fuel used for heating, cooking and electricity generation. Increasingly important in India, natural gas is typically found alongside oil reserves.

4.1 Distribution

Most of India's natural gas production comes from the Western offshore regions. Key areas include:

1. Mumbai : Holds approximately 70% of India's natural gas reserves.
2. Andhra Pradesh : Gas discovered near the Krishna-Godavari basin by Reliance Industries.
3. Rajasthan : Reserves located in the Khambhat Basin and Jaisalmer.
4. Additional reserves are present in Tamil Nadu, Gujarat, Assam and Tripura.

4.2 Advantages of Natural Gas

1. Direct Combustion : Can be burned directly for energy.
2. Cost-Effective and Eco-Friendly : Cheaper and better for the environment.
3. Versatile Uses : Utilized in electricity generation, vehicle fuel, fertilizers and more.

4.3 Disadvantages of Natural Gas

1. Limited Reserves : Finite and depleting resource.
2. Safety Hazards : Leakage can cause fires or explosions.
3. Non-Renewable : Exhaustible energy source.

5. HYDEL POWER

India is the fifth largest producer of hydroelectric power worldwide. Hydel power, generated from falling or fast-running water, is clean, renewable and cost-effective, helping to reduce greenhouse gas emissions.

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5. Coal is a_____solid stratified rock of organic and mineral matter.
(a) Combustible
(b) Non-combustible
(c) Renewable
(d) None of the above.

Ans : COMP 2010

Thus (a) is correct option

6. The Neyveli Lignite coal field in_____is the largest lignite deposit field in South India.
(a) Andhra Pradesh
(b) Telangana
(c) Puducherry
(d) Tamil Nadu

Ans : MAIN 2017

Thus (d) is correct option

7. _____Coal has_____per cent of carbon content and is the most preferred variety of coal.
(a) Lignite, 40
(b) Peat, 50
(c) Anthracite, 90
(d) Bituminous, 80

Ans : MAIN 2015

Thus (c) is correct option

8. Bituminous coal is also known as
(a) Coking coal
(b) Peat
(c) Steam oven
(d) Gas stove

Ans : SQP 2007

Thus (a) is correct option

9. Gondwana coal has variable quantities of_____.
(a) Low moisture
(b) Small sulphur
(c) Small variable quantity of phosphorus
(d) All of the above.

Ans : COMP 2015

Thus (d) is correct option

10. Anthracite is ideal for domestic use as it is smokeless and has high_____value.
(a) Industrial
(b) Calorific
(c) Volatile
(d) Demand

Ans : COMP 2009

Thus (b) is correct option

11. _____is also known as brown coal and is lower grade coal.
(a) Peat
(b) Lignite
(c) Anthracite
(d) Bituminous

Ans : MAIN 2011

Thus (d) is correct option

12. The liquid petroleum is called_____.
(a) Crude oil
(b) Liquid oil
(c) Natural gas
(d) Natural oil

Ans : SQP 2019

Thus (a) is correct option

13. Light distillates : gasoline :: middle distillates :_____.
(a) Diesel
(b) Lubricating oils
(c) Naphtha
(d) LPG

Ans : COMP 2021

Thus (a) is correct option

14. Petroleum is used
(a) As a fuel
(b) As raw material
(c) For power generation
(d) All of the above

Ans : MAIN 2023

Thus (a) is correct option

15. Name the main component of LPG.
(a) Methane
(b) Butane
(c) Propane
(d) Ethane

Ans : SQP 2002

NODIA

a fully export-oriented unit. The deposits in Kudremukh are recognized as some of the largest globally.

(iv) **Maharashtra - Goa Belt :** Covering the state of Goa and the Ratnagiri district of Maharashtra, this belt may not have the highest quality ores, but they are efficiently mined. The extracted iron ore is exported via the Marmagao port.

MAP BASED QUESTION

82. On the outline map of India mark and name two centres where each of these minerals are found :

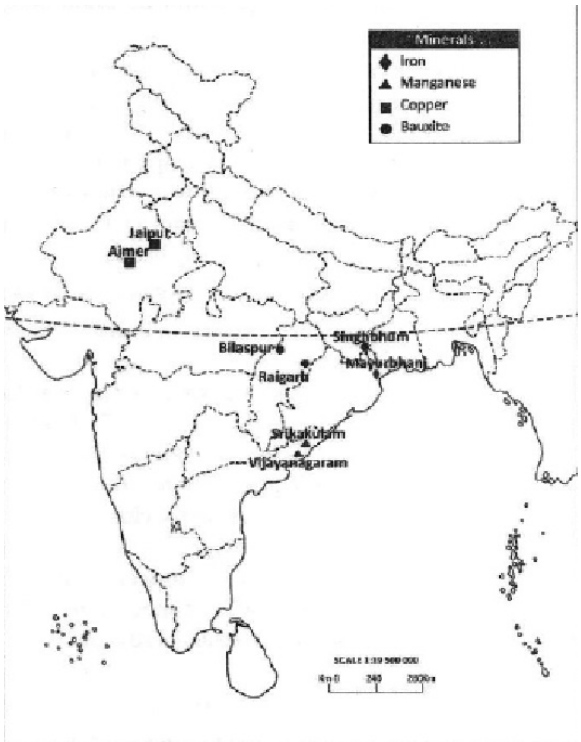
(i) Iron ore

(ii) Manganese

(iii) Copper

(iv) Bauxite

Ans : COMP 2010



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ONE MARK QUESTIONS

27. How is Bhakra Nangal dam beneficial for Punjab?

Ans : MAIN 2023

The Bhakra Nangal Dam benefits Punjab by providing irrigation water for agriculture and generating hydroelectric power for the region's energy needs.

28. Mention one advantage of using wind energy.

Ans : MAIN 2023

It is a renewable and clean source of energy, producing no greenhouse gases or pollution, making it environmentally friendly.

29. Name any two raw-materials derived from coal.

Ans : SQP 2009

Coke and Coal tar.

30. Name two industries that use a high quantity of coal.

Ans : COMP 2013

Iron and steel industry and cement industry.

31. Name two coastal and two inland oil-refineries in India.

Ans : MAIN 2013

(i) Coastal : Mumbai and Kochi.
(ii) Inland : Indian Oil Corporation Limited and Hindustan Petroleum Corporation Limited.

32. Name any two oil fields of western India.

Ans : SQP 2009

(i) Ankleshwar
(ii) Ahmedabad.

33. What are the different varieties of coal that are used for domestic purposes and why ?

Ans : COMP 2014

Anthracite and Bituminous. Because both these varieties contain high percentage of carbon with high calorific value.

34. Name the largest oil refinery in the Public Sector.

Ans : MAIN 2015

Guwahati Refinery (Assam)

35. Which type of coal is mostly used in Iron and steel industries ?

Ans : SQP 2016

Anthracite.

36. Copper is used in power cables. Give reasons.

Ans : COMP 2019

Because it is a good conductor of electricity.

37. Which multipurpose project provide power to both Punjab and Himachal Pradesh ?

Ans : MAIN 2018

Bhakra Nangal project.

38. Name any two sources of nuclear energy.

Ans : SQP 2019

Uranium and Thorium.

39. State the most important use of iron ore :

Ans : COMP 2015

Iron ore - Iron Extraction.

40. Name a metallic mineral for which the Balaghat district of Madhya Pradesh is famous.

Ans : MAIN 2019

Manganese

41. Name the source of energy found in the sedimentary rocks.

Ans : SQP 2014

Petroleum

42. Name any two offshore oil fields of India.

Ans : COMP 2018, 2009

Bombay - High and Bassein.

43. State any one disadvantage of coal found in India ?

Ans : SQP 2001

Calorific value of coal found in India is low.

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81. What is meant by hydel power ?

Ans : MAIN 2015

Hydroelectricity, also known as hydel power, is generated from the energy of falling water. A large dam is built to collect and store river water. When the water is released, it falls from a height, causing turbine blades at the dam's base to spin.

82. Why are tertiary coal fields considered inferior ? Name two states, one from North India and one from South India having such reserves.

Ans : SQP 2017

Tertiary coal fields are considered inferior because the coal is younger, lower in carbon content and mostly consists of lignite or sub-bituminous coal, which has lower energy efficiency and produces more ash than Gondwana coal.
States with tertiary coal fields:
(i) North India : Assam
(ii) South India : Tamil Nadu

83. Write a brief note on Gondwana coal.

Ans : COMP 2019

Gondwana coal is a form of bituminous coal marked by alternating dull and bright layers. It is nearly moisture-free but contains varying levels of sulfur and phosphorus. Overall, Gondwana coal is well-suited for use as steam or gas coal.

84. What is meant by irreplaceable and replaceable sources of power ?

Ans : MAIN 2021

(i) Irreplaceable Sources of Power : These are energy sources that cannot be replenished after they have been used. Once consumed, they cannot be restored or replaced, hence they are called irreplaceable sources of power.
(ii) Replaceable Sources of Power : These are energy sources that can be renewed or replenished by nature or through human efforts after utilization. Because they can be restored, they are referred to as replaceable sources of power.

85. Name one coal field each in the following States: Jharkhand, Orissa, West Bengal, Chhattisgarh.

Ans : SQP 2023

State	Coal field
Jharkhand	Jharia
Orissa	Talcher
West Bengal	Raniganj
Chhattisgarh	Korba

86. What are the uses of coal ?

Ans : COMP 2002

Use of coil :
(i) Basic source of energy : Coal is a primary energy source crucial for industrial growth.
(ii) Electricity generation : Coal is used to generate thermal power for electricity.
(iii) Railway system : Coal still plays a role in powering parts of the railway system.
(iv) Raw material for smelting : Coal is used as a raw material in smelting iron ore for steel production.

87. What are the objectives of N.T.P.C. ?

Ans : MAIN 2004

The objectives of N.T.P.C. are :
(i) Organizing and overseeing the comprehensive development of thermal power plants throughout India.
(ii) Strategizing and planning for the construction of new thermal power plants to meet growing energy demands.
(iii) Ensuring the implementation of better and more efficient technologies within thermal power units to enhance performance and sustainability.

88. What are the major uses of mineral oil ?

Ans : SQP 2006

The major uses of mineral oil are as follows :
(i) Kerosene, a by-product of petroleum, is commonly used as a domestic fuel.

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56. Which region (State) is the largest producer of petroleum in India ? Name the refinery where the production is refined.

Ans : COMP 2013, 2009

Bombay-High (Mumbai-High) in Maharashtra is India's leading producer of mineral oil, contributing over 60% of the nation's total production. The mineral oil extracted from this region is refined in Trombay.

57. Name one refinery which belongs to the private sector and one in the public sector.

Ans : MAIN 2005

Jamnagar refinery belongs to the private sector.
Guwahati refinery (Assam) belongs to the public sector.

58. Name the four different varieties of coal and name the largest producer of coal in South Asia.

Ans : SQP 2007

The four varieties are - Anthracite, Bituminous, Peat and Lignite. The largest producer is India.

59. Distinguish between the conventional and non-conventional sources of energy.

Ans : SQP 2018

Aspect	**Conventional Sources of Energy**	**Non-Conventional Sources of Energy**
Definition	Traditional sources of energy that have been used for a long time.	Newer sources of energy developed more recently
Exhaustibility	Limited and exhaustible (finite in nature).	Mostly renewable and inexhaustible (infinite in nature).

60. With reference to biogas answer the following questions :
(i) Name any two sources of biogas.
(ii) "Biogas is an ideal domestic fuel". Give three reasons.

Ans : COMP 2019, 2018

(i) Animal dung and poultry waste.
(ii) (a) Eco-friendly : It produces minimal pollution.
(b) Cost-effective : It is inexpensive and uses local waste.
(c) Efficient and safe : Burns smokelessly and is efficient for cooking and heating

NODIA

61. With reference to petroleum answer the following questions :
(i) Why is it called mineral oil ?
(ii) Write two of its uses.

Ans : MAIN 2012

(i) Petroleum is oil obtained from rocks, particularly sedimentary rocks of the earth. So it is called mineral oil.
(ii) Two uses of mineral oil :
(b) Fuel : Used as petrol, diesel and kerosene for transportation and energy.
(b) Industrial Raw Material : Used in the production of plastics, synthetic fibers and chemicals.

62. Mention any two advantages of Nuclear power.

Ans : SQP 2022

(i) High energy output : It produces large amounts of energy from small fuel quantities.
(ii) Low emissions : It generates minimal greenhouse gases, making it environmentally friendly.

63. How is coal formed ?

Ans : COMP 2009

Coal is formed as a result of the action of high pressure and temperature on the remains of forest products and plants buried deep into the earth for a long period of time.

(i) The production of iron, steel and a wide range of chemicals relies heavily on the availability of coal.
(ii) Coal is often referred to as "black gold" due to its significant role as an energy source and as a vital raw material for numerous industries.
(iii) The main coal-producing states in India include Jharkhand, West Bengal, Odisha, Madhya Pradesh, Chhattisgarh and Andhra Pradesh.
(iv) Four varieties of coal are :
(b) Anthracite (90% Carbon) : Characterized by its jet-black color, anthracite burns slowly without producing smoke or soot. It is clean to handle and possesses a high heating value.
(b) Bituminous Coal (50-80% Carbon) : This type of coal is used to produce coke, which is essential for the smelting of iron ore.
(c) Lignite (40% Carbon) : Lignite appears brown or brownish and contains high levels of ash and moisture. Its by-products provide various materials for industrial use.
(d) Peat : Peat is considered inferior to the other three types of coal due to its lower carbon content.

109. Give geographical reasons.
(i) Anthracite is used for domestic purposes.
(ii) Oil refineries are located close to oilfields or near ports.
(iii) The location of coalfield is an important factor in industrial development.

Ans : COMP 2012

(i) It is the highest grade of coal, with a high carbon content, making it burn efficiently, produce less smoke and generate more heat compared to other types of coal.
(ii) Oil refineries are located close to oilfields or near ports to reduce transportation costs and ensure a steady supply of crude oil. Being close to oilfields minimizes transport expenses, while proximity to ports facilitates easy import of crude oil from other countries.
(iii) Because coal is a major source of energy for industries. Industries that rely on coal for power generation and raw materials tend to develop near coalfields to reduce transportation costs and ensure a reliable energy supply.

110. (i) Name the multi-purpose project based on the River Satluj.
(ii) Briefly answer the following :
(a) Why is petroleum often referred to as "liquid gold" ?
(b) State one disadvantage of using coal as a source of power.

Ans : MAIN 2019

(i) Bhakhra Nangal Project
(ii) (a) Petroleum is referred to as "liquid gold" because of its high economic value and widespread use in fueling transportation, industries and as a raw material for numerous products. Its scarcity and global demand make it as valuable as gold.
(b) Coal combustion releases a significant amount of pollutants, including carbon dioxide, which contributes to air pollution and climate change.

111. (i) Name the following :
(a) An offshore oil field in the Gulf of Cambay.
(b) An oil refinery in Bihar.
(ii) State an important industrial use of Coal.

Ans : SQP 2017

(i) (a) Mumbai High
(b) Barauni Refinery
(ii) Coal is primarily used in the steel industry for the production of steel through the process of coking, where it is used as a reducing agent to convert iron ore into iron.

112. (i) Name the varieties of coal found in India.
(ii) Give a characteristic of each type of coal.

Ans : SQP 2013

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72. Which type of coal is commonly used in the production of thermal electricity ?

Ans : MAIN 2017

Lignite coal is commonly used in the prodiation of thermal electricity.

73. (i) Name two States that have deposits of the Gondwana coal.
(ii) Name two industries that use large quantity of coal.

Ans : SQP 2015

(i) West Bengal, Jharkhand.
(ii) (a) It is used in metal industries in blast furnace especially in smelting iron.
(b) In thermal power station to produce electricity.

74. Where is Mumbai High? What is Sagar Samrat?

Ans : COMP 2007

Mumbai High is an offshore oilfield located approximately 176 kilometers off the coast of Mumbai in the Arabian Sea.
Sagar Samrat is a self-propelled, jack-up type drilling platform used for extracting oil from depths over 1,400 meters. It operates at the Mumbai High oilfields.

75. Why is coal often used near the source of its mining whereas mineral oil is transported to great distances ?

Ans : MAIN 2009

Coal is typically utilized close to its production sites because most industries are located near coal fields. In contrast, oil refineries are usually situated far from oil fields, which necessitates transporting mineral oil over long distances.

76. What is nuclear power ?

Ans : MAIN 2012

Nuclear power is obtained from energy stored in the nuclei of atoms of naturally occuring radioactive elements like Uranium, Thorium and Plutonium.

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77. Name four products that are obtained during the refining process of petroleum.

Ans : MAIN 2003

(i) Petrol (Gasoline)
(ii) Diesel
(iii) Kerosene
(iv) Liquefied Petroleum Gas (LPG)

78. State any two advantages of using petroleum as a source of power.

Ans : SQP 2005

(i) Petroleum serves as a primary fuel source, with derivatives such as ethane, diesel, gasoline, jet fuel, kerosene and LPG. It provides lubrication and offers a compact, convenient fuel, making it essential for transportation across land, sea and air.
(ii) In India, petroleum is utilized for generating power primarily in select thermal power stations located near oil wells and refineries. Additionally, it is used in diesel and gas turbine power plants.

79. With reference to the Bhakra Nangal Dam, answer the following :
(i) Name the river on which it has been constructed.
(ii) Name two states that benefit from this project.

Ans : SQP 2011

(i) Sutlej River
(ii) Punjab and Haryana

80. (i) On which river is Hirakud Dam located ?
(ii) Give any two uses of this dam.

Ans : COMP 2013

(i) Hirakud Dam is constructed across the Mahanadi River, located about 15 km from Sambalpur in Odisha
(ii) Two uses of hirakund dam :
(b) The dam regulates the river's flow and generates hydroelectric power through multiple hydroelectric plants.
(b) It plays a crucial role in controlling floods in the Mahanadi delta and irrigates 75,000 square kilometers of land.

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Electricity generated by wind power can be utilized for domestic purposes, helping to reduce monthly electricity bills. Any surplus power produced can be sold back to the local grid, further increasing savings and contributing to the overall energy supply. This not only benefits homeowners financially but also supports the broader use of clean, renewable energy.

96. How is wind energy utilised to produce electricity?

Ans : MAIN 2015

Wind energy is utilized to produce electricity through wind turbines. When the wind blows, it turns the blades of the turbine, which are connected to a rotor. The rotor spins a generator, which converts the kinetic energy of the wind into electrical energy. This electricity can then be used locally or fed into the power grid for wider distribution.

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97. Give two advantages of using wind energy.

Ans : SQP 2001

(i) Eco-friendly : Wind energy is a clean and renewable source of power that produces no greenhouse gas emissions or air pollution.

(ii) Cost-effective : Once installed, wind turbines have low operating costs and can reduce dependence on fossil fuels, lowering energy expenses over time.

98. What are wind farms ? Where are they usually located ?

Ans : COMP 2003

Wind farms are groups of wind turbines that generate electricity on a large scale. They are usually located in windy areas like coastal regions, hilltops, plains, or offshore, where wind speeds are consistently high.

99. Name one area each where solar, wind, tidal and geothermal energy is generated in India.

Ans : MAIN 2005

(i) Solar energy : Bhadla Solar Park, Rajasthan

(ii) Wind energy : Muppandal Wind Farm, Tamil Nadu

(iii) Tidal energy : Gulf of Kutch, Gujarat

(iv) Geothermal energy : Puga Valley, Ladakh

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100. State any two advantages of using geothermal energy.

Ans : SQP 2007

(i) Environmentally friendly : Geothermal energy produces minimal greenhouse gas emissions and has a low environmental impact.

(ii) Reliable and sustainable : It provides a consistent and continuous source of energy, unlike some renewable sources that depend on weather conditions.

101. How is biogas beneficial for the farmers and householders?

Ans : COMP 2009

(i) Clean and Affordable Energy : Biogas is a cheap, clean and non-polluting source of energy.

(ii) Direct Gas Supply : The gas is supplied directly from the plant, eliminating any storage issues.

(iii) Rich Fertilizer Byproduct : The residual sludge is a nutrient-rich fertilizer containing beneficial bacterial biomass.

102. Name two minerals used for the generation of nuclear energy. Name two nuclear power plants in India.

Ans : MAIN 2011

Uranium and Thorium are two key minerals used for generating nuclear energy. In India, the Kudankulam Nuclear Power Plant in Tamil Nadu and the Tarapur Atomic Power Station in Maharashtra are notable nuclear power plants.

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(ii) Petrol and diesel, derived from mineral oil, are fuels for automobiles, aircraft and railway engines.
(iii) Mineral oil provides several valuable by-products, such as lubricants, terylene, paraffin wax, tar and vaseline.
(iv) It is also used for the generation of electricity.

89. Briefly mention how petroleum is obtained.

Ans : COMP 2008

Petroleum is extracted from sedimentary rocks. It forms through the decomposition of marine organisms that settle in silt or mud on the seabed over an extended period. The weight of overlying sediments, combined with Earth's movements, transforms the silt and mud into rock, with organic remains filling the pores. Under high heat and pressure, these organic remains are converted into mineral oil and natural gas.

90. What steps should be taken to conserve coal ?

Ans : MAIN 2010

Following steps should be taken to conserve coal :
(i) Coal wastage can be minimized by preventing selective mining practices.
(ii) Efforts should be made to explore new coal reserves.
(iii) Advanced technology must be implemented in the mining, production and utilization of coal.
(iv) Lower-grade coal should be mixed with higher-quality coal to optimize use.
(v) Investment from the private sector in coal mining should be promoted.

91. Name the important oil producing regions of India.

Ans : SQP 2012

The important oil producing regions of India are as follows :
(i) The northern plains stretching from the Brahmaputra Valley to Punjab via Bangladesh.
(ii) The coastal regions and their offshore continental shelves.
(iii) The Andaman and Nicobar Islands.
(iv) The Thar Desert.
(v) The plains of Gujarat.

92. How is the poor quality Indian coal being utilized?

Ans : COMP 2014

Low-quality Indian coal, specifically lignite, is mainly used for combustion in industries like fertilizers, paints and chemicals. Another poor-quality coal, peat, is commonly used as fuel in households and various small-scale or cottage industries.

93. What are power resources ? In India, which power resources we can found ?

Ans : MAIN 2016

Coal, petroleum, water and nuclear materials are the primary sources of power. South Asia is rich in water and coal but lacks significant petroleum reserves. Due to the ample availability of water and coal, the region can maximize power generation. India, being part of South Asia, also has abundant coal and water resources, which has enabled it to develop a strong electricity generation capacity.

94. What are non-conventional sources of energy?

Ans : SQP 2022

Non-conventional sources of energy are renewable energy sources that are sustainable and environmentally friendly. These sources are not based on fossil fuels and are replenished naturally. They have gained importance due to their low environmental impact and potential to reduce dependency on conventional, non-renewable resources. Examples are : Solar energy, Wind energy, Biomass energy, Tidal energy, Geothermal energy

95. Wind energy can generate additional income for the land owners.

Ans : COMP 2018

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64. Name the states where Gondwana coal is found.

Ans : MAIN 2011

Jharkhand, Orissa, Madhya Pradesh, West Bengal, Maharashtra and Andhra Pradesh.

65. How is Gondwana coalfield different from tertiary coalfield in terms of location and quality?

Ans : MAIN 2022

Gondwana coalfields are located in central and eastern India, like Jharkhand, Odisha and Chhattisgarh, while tertiary coalfields are found in the northeastern states like Meghalaya and Assam. Gondwana coal is older and higher quality, mainly bituminous, whereas tertiary coal is younger and lower quality, mostly lignite.

66. Name the two coastal oil-refineries, one on the west coast of India and the other on the east coast of India. Name one inland oil refinery. List the sources of crude oil for these refineries.

Ans : COMP 2001

(i) Two coastal oil refineries :
   (a) West Coast : Mumbai Refinery (Maharashtra)
   (b) East Coast : Vishakhapatnam Refinery (Andhra Pradesh)

(ii) One inland oil refinery : Barauni Refinery (Bihar)

(iii) Sources of crude oil :
   (a) Mumbai Refinery : Receives crude oil from Mumbai High (offshore), Middle East and Africa.
   (b) Vishakhapatnam Refinery : Sources crude oil from the Krishna-Godavari Basin (domestic) and imports from the Middle East.
   (c) Barauni Refinery : Receives crude oil via pipelines from Assam (Digboi oilfields) and imports from the Middle East.

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67. State why Jharkhand State in known for its coal fields.

Ans : SQP 2014

Jharkhand is renowned for its rich coal fields, contributing about 50% of India's total coal output through the Jharia mines. Additionally, significant coal mines are located in Bokaro, Giridih, North Karanpura and South Karanpura.

68. What is meant by conventional sources of energy ? Name any two conventional sources of energy.

Ans : COMP 2016

Conventional sources of energy are traditional energy sources that have been used for a long time and are typically derived from fossil fuels or natural resources. These sources are non-renewable and can deplete over time.
Two conventional sources of energy:
(i) Coal
(ii) Petroleum

69. Where is natural gas found in India ? Name two coastal and two inland oil-refineries in India.

Ans : MAIN 2018

India's natural gas is primarily sourced from Mumbai High, with additional production occurring in Assam, Tamil Nadu, Rajasthan and Tripura. The country operates two coastal oil refineries located in Kochi (BPCL) and Chennai (IOC), along with two inland refineries in Diglaoi (IOCL) and Trombay (BPCL).

70. Name the best quality of coal. Where is it found in India ?

Ans : SQP 2013

Anthracite is the best quality of coal. It is found in Jammu & Kashmir State of India.

71. Name the most commonly used type of coal in India.

Ans : COMP 2015

Bituminous coal is the most commonly used type of coal in India.

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THREE MARKS QUESTIONS

103. (i) Mention two ways in which Hirakud dam has helped the people of Odisha?
(ii) Across which river is the Hirakud dam built?

Ans : MAIN 2024

(i) Two ways in which hirakund dam has helped the people of odisha :

(a) Irrigation : It provides water for irrigation, helping farmers to cultivate crops even during dry seasons.

(b) Flood Control : The dam helps in controlling floods in the Mahanadi river basin, protecting nearby areas from flood damage.

(ii) The Hirakud Dam is built across the Mahanadi river.

104. Give reasons for each of the following:
(i) Geothermal energy is not popular in India.
(ii) Solar energy is gaining popularity.
(iii) Petroleum is considered a harmful source of energy.

Ans : MAIN 2024

(i) India has limited geothermal resources and the cost of tapping geothermal energy is high due to the need for advanced technology and infrastructure, making it less viable compared to other energy sources.

(ii) Solar energy is renewable, abundant and environmentally friendly. With advances in solar technology and decreasing costs, it is becoming a more accessible and sustainable option for energy generation.

(iii) The combustion of petroleum releases greenhouse gases and pollutants into the atmosphere, contributing to air pollution, global warming and environmental degradation.

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105. Name the following:
(i) A mineral used to generate nuclear energy.
(ii) The non-conventional energy source that has the most widespread potential usage in India.
(iii) An offshore oil field of India.

Ans : MAIN 2023

(i) Uranium.
(ii) Solar energy.
(iii) Bombay High.

106. Name the states in which the following mines are located :
(i) Singhbhum Copper mine
(ii) Khetri copper mine
(iii) Kudermukh iron ore mine

Ans : MAIN 2012

(i) Singhbhum Copper Mine: Located in Jharkhand.

(ii) Khetri Copper Mine : Located in Rajasthan.

(iii) Kudremukh Iron Ore Mine : Located in Karnataka.

107. Give a reason for the following :
India's location is advantageous for the generation of solar power.

Ans : SQP 2019

India's location is advantageous for the generation of solar power because it lies in the tropical region, receiving abundant sunlight throughout the year. Most parts of the country experience clear skies and long sunny days, especially in states like Rajasthan, Gujarat and Maharashtra, making India ideal for harnessing solar energy on a large scale.

108. With reference to coal, answer the following questions :
(i) Mention one of its use
(ii) Why is it called black gold ?
(iii) Where is it found in India ?
(iv) What are the four varieties of coal ?

Ans : SQP 2016

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44. Why does India have to import oil ?

Ans : COMP 2003

India is deficient in Petroleum, so India have to import oil.

45. What are the qualities of the tertiary coal ?

Ans : SQP 2019

The tertiary coal contains low percentage of carbon and high percentage of sulphur and moisture.

46. Where are the tertiary coal fields located ?

Ans : COMP 2021

Tertiary coal fields are located mainly at Makum in Assam and Palna in Rajasthan.

47. Which coal fields supply coal to Rourkela Steel Plant ?

Ans : MAIN 2023

Jharia, Raniganj, Talcher and Korba coal fields supply coal to Rourkela Steel Plant.

48. Name one coal field each in Chhattisgarh and Madhya Pradesh.

Ans : SQP 2002

Korba coal field is located in Chhattisgarh and Singrauli coal field is located in Madhya Pradesh.

49. Name the largest coal field in India.

Ans : COMP 2004

Lower Gondwana coal field is the largest coal field in India.

50. Name the oldest coal field in India.

Ans : MAIN 2006

Raniganj is the oldest coal field in India.

51. Why should we conserve coal ?

Ans : SQP 2008

We should conserve coal because it is exhaustible and non-renewable source of energy.

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TWO MARKS QUESTIONS

52. Why is conventional source of energy not considered an ecofriendly source of energy?

Ans : MAIN 2023

Conventional energy sources like coal, oil and natural gas are not eco-friendly as they emit greenhouse gases, cause pollution and deplete finite resources, contributing to climate change and environmental degradation.

53. Name the following :
(i) Largest coal field of India.
(ii) Oldest oil-field of India.

Ans : SQP 2016

(i) Jharia Coalfield (located in Jharkhand)
(ii) Digboi Oil Field (located in Assam).

54. Which are the two richest and oldest coal fields of India ? Name the state where these lie.

Ans : COMP 2013, 2009

The two richest and oldest coal fields of India are:
(i) Jharia Coalfield : Located in Jharkhand.
(ii) Raniganj Coalfield : Located in West Bengal.

55. With reference to nuclear energy answer the following questions :
(i) "It has vast potential for future development". Give reason.
(ii) State any two sources of nuclear energy.

Ans : MAIN 2022

(i) Nuclear energy has vast potential because it can generate a large amount of energy from a small amount of fuel, making it highly efficient. It also produces minimal greenhouse gas emissions, offering a cleaner alternative to fossil fuels, which is crucial for meeting future energy demands while combating climate change.

(ii) Uranium and thorium, used in the production of nuclear energy, are found in Jharkhand, Rajasthan and Kerala.

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(i) Varieties of coal found in India :
  (a) Anthracite
  (b) Bituminous
  (c) Lignite
  (d) Peat

(ii) Characteristic of each type of coal :
  (a) Anthracite : It has the highest carbon content, burns efficiently with minimal smoke and generates the most heat.
  (b) Bituminous : It is widely used for electricity generation and has a high carbon content with good heating capacity.
  (c) Lignite : It has lower carbon content and is softer, producing less heat compared to higher-grade coal.
  (d) Peat : It is the lowest grade of coal with the least carbon content and heating capacity, often used in its natural state for fuel in rural areas.

113. Give a geographical reason for each of the following :
(i) Petroleum is called 'liquid gold'.
(ii) Natural gas is a fossil fuel.
(iii) CNG is an eco-friendly fuel.

Ans : COMP 2015

(i) Petroleum is known as "liquid gold" because every part of crude oil is utilized without any waste. Not even the smallest fraction goes unused, underscoring its immense value.

(ii) Natural gas is classified as a fossil fuel because it forms from the decomposed remains of plants and animals that were buried beneath the Earth millions of years ago. These natural gas deposits often accompany oil reserves.

(iii) Compressed Natural Gas (CNG) is considered an eco-friendly fuel because it causes less environmental damage. Composed mainly of methane, it results in lower carbon emissions compared to other fossil fuels.

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114. (i) State two advantages of coal as a source of power.
(ii) Where is the oldest oilfield located in India?

Ans : MAIN 2017

(i) Two advantages of coal as a source of power :
  (a) Abundant supply : Coal is widely available and one of the most abundant fossil fuels, providing a reliable energy source.
  (b) Cost-effective : It is relatively inexpensive to mine and use for electricity generation, making it an affordable energy option.

(ii) The oldest oilfield in India is located at Digboi in Assam.

115. What is Natural Gas ? Name two variants of natural gas.

Ans : SQP 2019

Natural gas is a fossil fuel composed primarily of methane, found deep beneath the Earth's surface. It is a clean-burning energy source used for heating, electricity generation and as an industrial raw material.
Two Variants of Natural Gas:
(i) Liquefied Petroleum Gas (LPG)
(ii) Compressed Natural Gas (CNG)

116. (i) Why do the natural gas deposits mostly accompany oil deposits ?
(ii) What is added to domestic gas cylinders, which gives a foul smell ? Why ?

Ans : COMP 2021

(i) Natural gas is a fossil fuel that often accompanies oil deposits because it is formed from the decomposed remains of plants and animals buried underground over millions of years.

(ii) The primary component of Liquefied Petroleum Gas (LPG) is butane, along with propane and ethane. While LPG is naturally odorless, the gas in our domestic cylinders has a distinct foul smell. This odor comes from ethyl mercaptan, a strong-smelling substance added to LPG

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CHAPTER 10

AGRICULTURE

SUMMARY

1. IMPORTANCE OF AGRICULTURE IN INDIA

(i) Agriculture is the backbone of the Indian economy, playing a vital role in supporting the livelihoods of more than half of the population. It contributes significantly to the country's Gross Domestic Product (GDP) and is a key sector in ensuring food security. Indian agriculture also provides raw materials to various industries such as textiles, sugar and edible oils.

(ii) In rural India, agriculture is not only a source of employment but also the primary economic activity that drives regional development. It supports ancillary industries and fosters trade both domestically and internationally. With India being one of the top producers of cereals, pulses, fruits and vegetables globally, agriculture also plays a crucial role in international trade, boosting the country's foreign exchange.

2. PROBLEMS IN INDIAN AGRICULTURE

2.1 Low Productivity

One of the main challenges in Indian agriculture is low productivity per hectare. Traditional farming practices, limited use of advanced technology and poor irrigation infrastructure contribute to inefficiencies in crop production.

2.2 Monsoon Dependency

A large portion of Indian agriculture is still dependent on the monsoon rains. Unpredictable weather patterns and insufficient irrigation systems make farmers vulnerable to droughts or excessive rains, leading to crop failures.

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2.3 Fragmented Landholdings

Due to population pressure and the division of family landholdings over generations, farms in India are becoming increasingly smaller and fragmented. This fragmentation leads to reduced efficiency and difficulties in using modern farming techniques and machinery.

2.4 Lack of Access to Modern Technology

Indian farmers often have limited access to modern farming equipment, high-yield seeds, fertilizers and scientific advancements in agriculture. This lack of modernization hampers the potential to improve yields and crop quality.

2.5 Soil Degradation

Overuse of chemical fertilizers, pesticides and intensive farming practices have led to soil degradation in many regions, further reducing productivity.

2.6 Farmer Indebtedness

Many farmers rely on loans to finance their crops. In cases of crop failure, especially due to weather extremes, farmers often fall into a cycle of debt that is difficult to escape, resulting in economic distress.

3. REFORMS IN INDIAN AGRICULTURE

3.1 Green Revolution

Introduced in the 1960s, the Green Revolution brought about the use of high-yield variety (HYV) seeds, chemical fertilizers and improved irrigation facilities. This initiative led to a significant increase in food production, particularly in wheat and rice, making India self-sufficient in food grains.

122. State any three disadvantages of hydel power.

Ans : COMP 2010

(i) Environmental impact : Hydel power projects can disrupt ecosystems and biodiversity.
(ii) Displacement of people : Dams often force communities to relocate.
(iii) High initial costs : Building hydropower infrastructure requires significant investment.

123. Name the region in which India's main coalfields are located. What is the quality of coal found here ? What are its uses ?

Ans : MAIN 2012

The oldest coalfield in India is located at Raniganj in West Bengal, while the largest coalfield is found at Jharia in Jharkhand.

(i) Quality of Coal in India : In India, coal deposits are mainly found in rock sequences from two geological ages :
  (a) Gondwana Formations : These are over 200 million years old. The Gondwana coalfields predominantly contain bituminous coal, which has a carbon content ranging from 50% to 80%. This is the most commonly available coal type in India.
  (b) Tertiary Deposits : Formed about 55 million years ago during a later geological epoch. However, India does not have extensive deposits of the highest grade anthracite coal (which contains about 90% carbon).
(ii) Uses of Coal in India : Coal is extensively used in India in the following three ways:
  (a) Generation of Thermal Power : Coal is a primary fuel for thermal power plants, producing a significant portion of the country's electricity.
  (b) Iron and Steel Industry : It serves as a vital raw material for the production of iron and steel.
  (c) Brass Foundries : Coal is used as a fuel in brass foundries for melting and casting processes.

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124. State three advantages of dams.

Ans : SQP 2014

Three advantages of dams :

(i) Hydel power is clean and non-polluting, as it produces no harmful wastes or greenhouse gases, preventing air and water contamination and mitigating global warming effects.
(ii) Renewable energy source, hydel power can be used repeatedly, making it sustainable and economical compared to fossil fuels and nuclear power.
(iii) Dams for hydroelectricity help conserve water and provide a cost-effective alternative to energy production, reducing the need for fossil fuels.

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125. State three disadvantages of building, a big dam

Ans : COMP 2016

Three disadvantages of building, a big dam are :

(i) Displacement of communities : Large dams often require the relocation of people living in the area, leading to social and economic disruptions.
(ii) Environmental damage : Dams can cause deforestation, alter ecosystems and negatively impact wildlife, particularly aquatic species.
(iii) High construction costs : Building a big dam requires significant financial investment and the construction process can take many years.

126. Give a reason for each of the following :

(i) Conventional sources of energy are called the resources of the future.
(ii) India is an advantageous position in terms of solar energy.
(iii) Harvesting of solar energy does not require much maintenance.

Ans : MAIN 2022

(i) Because they are abundant, well-established and are expected to remain critical in the energy mix for many years, despite the rise of renewable alternatives.

(ii) India is fortunate to receive a significant amount of solar energy, approximately 5,000 trillion kWh annually, due to its location along the Tropic of Cancer. Most regions in the country experience around 300 sunny days each year, with solar energy availability ranging from 5 to 7 kW per hour per square kilometer.

(iii) Solar energy systems require minimal maintenance because they have no moving parts, meaning there is no wear and tear. Once the initial installation cost is covered, the need for maintenance and repair is very low.

127. How is India in an advantageous position to harness solar energy ?

Ans : SQP 2018

India is in an advantageous position to harness solar energy due to the following reasons :

(i) Location of India : Positioned on the Tropic of Cancer, India receives around 5,000 trillion kWh of solar energy per year. Most regions enjoy about 300 sunny days annually, with solar energy availability between 5 to 7 kW per hour per square kilometer.

(ii) Thar Desert : India's Thar Desert has the potential to become a solar energy powerhouse, offering vast open land for large-scale solar installations.

(iii) Versatile Uses : Solar energy has multiple applications such as cooking, water pumping, refrigeration and street lighting, leading to increased future demand.

(iv) Developing Country : As India continues to develop, energy consumption is expected to rise, boosting the need for renewable energy sources like solar power.

128. State briefly how the sun's energy can be used to generate power.

Ans : COMP 2015

Solar photovoltaic systems and solar collectors are used for power generation. Solar cells, also known as photovoltaic cells, are made from thin wafers of semiconductor materials like silicon and gallium. When sunlight hits these cells, they convert solar energy into electricity. Multiple solar cells combined in a solar panel can generate a significant amount of electricity. Solar cells are commonly used in rural, forest, hilly and desert areas for lighting, railway signaling and rural telecommunication systems.

129. State any three advantages of using solar energy.

Ans : MAIN 2001

Advantages of solar energy :

(i) Renewable and sustainable : Solar energy is a limitless resource that can be harnessed continuously without depleting natural resources.

(ii) Environmentally friendly : It produces no greenhouse gas emissions or air pollutants, reducing the carbon footprint.

(iii) Low operating costs : Once solar panels are installed, the maintenance and operating costs are minimal compared to conventional energy sources.

130. What is tidal energy ? Give an advantage of using tidal energy.

Ans : SQP 2003

Tides refer to the periodic rise and fall of ocean waters, caused by the gravitational pull of the Moon and Sun. This movement generates tidal energy.

Advantages of tidal energy :

(i) Tidal energy plants produce no carbon emissions, making it environmentally friendly.

(ii) Tidal energy can be generated even with slow-moving water.

(iii) Tides are driven by the Earth, Moon and Sun's gravitational forces, making tidal energy a reliable and inexhaustible source.

131. (i) What is geothermal energy ?

(ii) How is geothermal energy used to produce electricity ?

Ans : COMP 2005

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(i) Geothermal energy is the heat stored within the Earth, originating from the planet's core, volcanic activity and the decay of radioactive materials. This energy is found in the form of steam, hot water, or hot rocks beneath the Earth's surface.

(ii) Generation of Geothermal Energy : Geothermal resources include steam, hot water and hot rocks located deep beneath the Earth's surface. High-pressure steam from deep reservoirs is used to spin a turbine connected to a generator, producing electricity. Hot water is pumped from underground and when the pressure drops at the surface, it turns into steam. This steam drives the turbine to generate power. After cooling in a tower, the steam condenses back into water, which is then pumped back into the Earth to restart the cycle.

132. Name the process involved in generation of nuclear energy. State any three advantages of using nuclear power.

Ans : MAIN 2007

The process involved in the generation of nuclear energy is nuclear fission, where the nucleus of an atom (typically uranium or plutonium) is split into smaller parts, releasing a large amount of energy. Advantages of using nuclear power :

(i) Nuclear energy helps reduce reliance on fossil fuels like coal and oil, leading to lower fossil fuel consumption and a decrease in greenhouse gas emissions.

(ii) It not only conserves raw materials but also cuts down on transportation, handling and extraction costs. The cost of nuclear fuel, particularly uranium, accounts for just 20% of the total cost of energy production.

(iii) Nuclear power provides a continuous supply of electricity, with nuclear plants operating nearly 90% of the time each year. This stability helps mitigate the price fluctuations of other fuels, such as petroleum.

133. What is biogas ? How is biogas produced ?

Ans : SQP 2009

Biogas is an energy-rich gas produced from organic waste such as farm residues, shrubs, animal waste and human waste.

(i) It is a non-conventional energy source.

(ii) Biogas has a higher thermal efficiency compared to fuels like kerosene, cow dung, coal and charcoal.

Biogas Generation : A digester tank is installed underground to process the dung-water mixture, which enters through an inlet pipe. The digested waste, or slurry, is discharged through an outlet pipe on the other side. A gas outlet, controlled by a pipe, releases the generated biogas.

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so that any gas leakage can be detected immediately.

117. Give two advantages and one disadvantage of natural gas.

Ans : MAIN 2023

(i) Advantages of natural gas:
  (a) Clean energy : Natural gas burns cleaner than other fossil fuels, producing fewer pollutants and lower carbon dioxide emissions.
  (b) Efficient energy source : It provides efficient and reliable energy for heating, electricity generation and transportation.

(ii) Disadvantage of natural gas : Despite being cleaner, natural gas is still a fossil fuel and its reserves are finite, making it unsustainable in the long term.

118. (i) Which state is the largest producer of mineral oil ?
(ii) Mention any two advantages of hydel power.

Ans : SQP 2002

(i) Rajasthan state.
(ii) Two advantages of hydel power :
  (b) Renewable energy source : Hydropower uses water, a renewable resource, ensuring sustainable energy production.
  (b) Environmentally friendly : Hydropower generates electricity without emitting greenhouse gases, making it a clean energy option

119. Where are the deposits of Petroleum normally located ? Give two uses of Petroleum besides being used as a fuel.

Ans : COMP 2004

India's entire oil production comes from three main regions: the Assam-Arakan belt, the Gujarat Cambay belt and the Bombay High offshore zone. The Assam-Arakan belt stretches from the far northeast of Assam to the eastern borders of the Brahmaputra and Surma valleys. The Gujarat Cambay belt extends from Mahesana in Gujarat in the north to the continental shelf off the coast of Ratnagiri in Maharashtra in the south.
Uses : As a raw material for petrochemicals – Petroleum is used to produce plastics, synthetic rubber and chemicals.
In the production of lubricants – Petroleum is refined to create lubricating oils used in machinery and engines.

120. Give a reason for each of the following:
(i) Magnetite is so called.
(ii) Copper is used for making electric wires.
(iii) Aluminium is used for makingaircraft.

Ans : MAIN 2006

(i) Magnetite is so called because it exhibits natural magnetic properties, making it one of the most magnetic minerals on Earth.
(ii) Copper is used for making electric wires due to its excellent electrical conductivity, which allows electricity to flow efficiently with minimal energy loss. It is also ductile and resistant to corrosion, making it ideal for wiring.
(iii) Aluminium is used for making aircraft because it is lightweight, strong and resistant to corrosion, which helps improve fuel efficiency while maintaining structural integrity.

121. State any three disadvantages of using petroleum.

Ans : SQP 2008

(i) Petroleum is a natural, non-renewable fossil fuel with limited availability. Due to ever-increasing demand, petroleum resources are rapidly depleting.
(ii) Extracting and burning petroleum release green house gases that contribute to environmental pollution and global warming.
(iii) Its costs are quite high because of its limited supply and high demand.
(iv) Petroleum is highly flammable and poses a risk of causing fires.

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3.2 Irrigation Projects

The government has implemented various large-scale irrigation projects to reduce the dependency on monsoon rains. These projects include the construction of dams, canals and water conservation techniques such as drip irrigation and rainwater harvesting.

3.3 Subsidies and Loan Schemes

The government provides financial support to farmers through subsidies on fertilizers, seeds and electricity. Loan waiver programs and low-interest loans are also offered to help farmers manage their finances and invest in agricultural inputs.

3.4 Promotion of Organic Farming

There is a growing emphasis on sustainable agricultural practices, such as organic farming, which reduces the dependence on chemical fertilizers and pesticides. Organic farming is being promoted to restore soil health, reduce environmental degradation and cater to the increasing demand for organic products globally.

3.5 Digital Agriculture

The introduction of digital platforms and apps provides farmers with real-time information on weather patterns, crop prices and best farming practices. E-market platforms like e-NAM (National Agriculture Market) allow farmers to sell their produce at competitive prices directly.

4. TYPES OF FARMING IN INDIA

Indian agriculture is highly diverse due to the varying geography, climate and cultural practices. The farming systems range from subsistence farming to highly commercialized farming.

4.1 Subsistence Farming

(i) **Purpose :** Primarily aimed at producing food for the farmer's family with little surplus for sale.

(ii) **Characteristics :** This type of farming is practiced on small landholdings with traditional tools and minimal use of fertilizers or pesticides. The produce is mainly for local consumption and crops like rice, wheat and pulses are common.

(iii) **Regions :** It is prevalent in parts of eastern and northeastern India, where the landholdings are small and the focus is on self-sufficiency.

4.2 Commercial Farming

(i) **Purpose :** This type of farming is done primarily for the market, with the intention of earning profits.

(ii) **Characteristics :** Commercial farming involves large-scale production, the use of modern equipment and the cultivation of cash crops like sugarcane, cotton, tea and coffee. It is capital-intensive and relies heavily on modern techniques.

(iii) **Regions :** It is practiced in states like Punjab, Haryana and parts of Maharashtra, where agriculture is highly mechanized.

4.3 Shifting Cultivation (Slash and Burn)

(i) **Purpose :** Farmers clear a patch of land by cutting down vegetation and burning it. The land is then cultivated for a few years before being abandoned when the soil fertility diminishes.

(ii) **Regions :** It is commonly practiced in the hilly areas of northeastern India. The practice is environmentally damaging due to the deforestation involved.

4.4 Intensive Farming

(i) **Purpose :** To maximize output from small landholdings through high inputs like labor, fertilizers and irrigation.

(ii) **Characteristics :** It focuses on the cultivation of crops such as rice, wheat and sugarcane using high-yield varieties (HYV) and other intensive techniques. Intensive farming is labor-intensive and aims at increasing productivity per unit area.

(iii) **Regions :** Found in regions with high population densities, such as West Bengal, Kerala and Tamil Nadu.

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and resistance to pests.

(iv) Processing and Distribution: Cotton is processed in ginneries and used for textile production. Gujarat, Maharashtra and Telangana are major producers.

7.4 Jute

(i) Climatic Conditions: Hot and humid weather with heavy rainfall (100-200 cm).

(ii) Soil Requirements: Alluvial soil with high water-retention capacity.

(iii) Cultivation Methods: Jute is grown in low-lying flood-prone areas and harvested in the rainy season.

(iv) Processing and Distribution: Jute is processed into fibers for use in packaging and textiles. West Bengal and Assam are leading producers.

7.5 Tea

(i) Climatic Conditions: Cool, humid climate with frequent rainfall and well-distributed sunshine.

(ii) Soil Requirements: Well-drained, acidic soil.

(iii) Cultivation Methods: Tea plants are cultivated in terraced fields on hilly slopes. Hand-picking of tea leaves is common for higher-quality varieties.

(iv) Processing and Distribution: Tea leaves are processed into black, green, or oolong tea. Assam, Darjeeling (West Bengal) and Nilgiri (Tamil Nadu) are famous tea-growing regions.

7.6 Coffee

(i) Climatic Conditions: Warm, tropical climate with moderate rainfall and consistent humidity.

(ii) Soil Requirements: Fertile, well-drained soil rich in organic matter.

(iii) Cultivation Methods: Coffee is grown on hilly terrain under shade trees to maintain quality.

(iv) Processing and Distribution: Coffee beans are processed and exported to international markets. Karnataka, Kerala and Tamil Nadu are key coffee-producing states.

MULTIPLE CHOICE QUESTION

1. Which of the following farming method is used to grow tea on a large scale?
(a) Subsistence farming
(b) Plantation farming
(c) Mixed farming
(d) Shifting agriculture

Ans : MAIN 2024

Thus (b) is correct option.

2. Wheat and barley are associated with which agricultural season?
(a) Kharif
(b) Zaid
(c) Rabi
(d) None of the above

Ans : SQP 2024

Thus (c) is correct option.

3. The_____content in sugarcane decreases if heavy rains continue for long time.
(a) glucose
(b) fructose
(c) sucrose
(d) lactose

Ans : SQP 2024

Thus (c) is correct option.

4. Which of the following is NOT a problem of Indian agriculture?
(a) Dependence on monsoon
(b) Small land holdings
(c) Two main cropping seasons
(d) Use of traditional methods of farming

Ans : MAIN 2023

Thus (c) is correct option.

5. Which of the following is a staple food grain of Indians?
(a) Wheat
(b) Rice
(c) Gram
(d) Arhar

Ans : MAIN 2023

Thus (b) is correct option.

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practice direct seeding. Advanced techniques like SRI (System of Rice Intensification) are also being used to increase yield.

(iv) Processing and Distribution: After harvesting, rice is milled and processed. India is a leading exporter of rice globally, with major production states being West Bengal, Uttar Pradesh and Andhra Pradesh.

6.2 Wheat

(i) Climatic Conditions: Requires a cool and dry climate for growth, with temperatures ranging from 12°C to 25°C.

(ii) Soil Requirements: Well-drained loamy soil with moderate fertility.

(iii) Cultivation Methods: Wheat is sown using traditional or modern machinery, depending on the region. The crop is irrigated and fertilized for optimal growth.

(iv) Processing and Distribution: Wheat is processed in mills and is a staple food across northern India, where major production occurs in states like Punjab, Haryana and Madhya Pradesh.

6.3 Millets (Bajra, Jowar)

(i) Climatic Conditions: Thrive in warm and dry climates with moderate rainfall.

(ii) Soil Requirements: Light, sandy soil with low fertility can support millet growth.

(iii) Cultivation Methods: Millets are typically grown in rainfed areas, requiring minimal irrigation.

(iv) Processing and Distribution: Millets are processed into flour or used whole in cooking. Major millet-growing states include Rajasthan, Karnataka and Maharashtra.

6.4 Pulses

(i) Climatic Conditions: Semi-arid regions with low to moderate rainfall are ideal for pulse cultivation.

(ii) Soil Requirements: Well-drained loamy or sandy soil.

(iii) Cultivation Methods: Pulses are usually grown as a rotation crop to replenish soil fertility. They are grown without intensive fertilizers.

(iv) Processing and Distribution: Pulses are cleaned, de-husked and split before distribution. India is the world's largest producer and consumer of pulses, with key production in Madhya Pradesh, Uttar Pradesh and Rajasthan.

7. COMMERCIAL CROPS

7.1 Sugarcane

(i) Climatic Conditions: Hot and humid climate with a long growing season of 10 to 18 months.

(ii) Soil Requirements: Deep, well-drained fertile soil with a high water table.

(iii) Cultivation Methods: Sugarcane is propagated using cuttings and requires heavy irrigation. The crop is labor-intensive.

(iv) Processing and Distribution: Sugarcane is processed into sugar, jaggery and ethanol. Major producing states are Uttar Pradesh, Maharashtra and Karnataka.

7.2 Oilseeds (Groundnut, Mustard, Soya Bean)

(i) Climatic Conditions: Warm, sunny weather with moderate rainfall.

(ii) Soil Requirements: Well-drained loamy soil with adequate nutrients.

(iii) Cultivation Methods: Oilseeds are grown using traditional and modern methods. Groundnut is often grown in sandy soil, while mustard prefers cooler climates.

(iv) Processing and Distribution: Oilseeds are processed into edible oils and other by-products. Gujarat, Rajasthan and Madhya Pradesh are leading producers.

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7.3 Cotton

(i) Climatic Conditions: Warm and sunny weather, with rainfall during the growing season and dry weather during harvest.

(ii) Soil Requirements: Black soil with good moisture-retention capacity.

(iii) Cultivation Methods: Cotton is grown using genetically modified seeds (BT cotton) in many regions to improve yield

4.5 Extensive Farming

(i) **Purpose :** Practiced on large areas of land with relatively lower inputs of labor and capital per hectare.
(ii) **Characteristics :** Extensive farming involves large landholdings, mechanized farming and focuses on crops like wheat and corn. The output per unit area is lower, but the total production is significant due to the vast area under cultivation.
(iii) **Regions :** Found in sparsely populated areas like parts of Rajasthan and Madhya Pradesh.

4.6 Plantation Farming

(i) **Purpose :** Plantation farming is practiced for the cultivation of a single crop on large estates, usually for export.
(ii) **Characteristics :** This type of farming is capital-intensive and requires a significant investment in infrastructure like processing factories and irrigation. Crops like tea, coffee, rubber and spices are common.
(iii) **Regions :** Practiced in regions with favorable climates for the cultivation of specific crops, such as Assam (tea), Kerala (rubber and spices) and Karnataka (coffee).

4.7 Mixed Farming

(i) **Purpose :** Combines crop cultivation and livestock rearing on the same farm.
(ii) **Characteristics :** Mixed farming allows farmers to diversify income sources by producing crops and raising animals like cows, goats, or poultry. It is practiced in regions where both farming and animal husbandry are feasible.
(iii) **Regions :** Found in parts of Punjab, Haryana and western Uttar Pradesh.

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5. AGRICULTURAL SEASONS IN INDIA

India experiences three main cropping seasons based on climatic conditions:

5.1 Rabi Season (Winter Season)

(i) Sowing Period: October to December.
(ii) Harvesting Period: March to April.
(iii) Climate: Requires a cool and dry climate during sowing and warm temperatures during harvesting.
(iv) Key Crops: Wheat, barley, mustard, peas and gram.
(v) Regions: Northern states like Punjab, Haryana and Uttar Pradesh are known for Rabi crops.

5.2 Kharif Season (Monsoon Season)

(i) Sowing Period: June to July, with the onset of monsoon rains.
(ii) Harvesting Period: September to October.
(iii) Climate: Warm and humid conditions with adequate rainfall are ideal for these crops.
(iv) Key Crops: Rice, maize, millet, cotton, groundnut and pulses.
(v) Regions: States like West Bengal, Odisha, Andhra Pradesh and Tamil Nadu are major Kharif crop producers.

5.3 Zayad Season (Summer Season)

(i) Sowing Period: March to June.
(ii) Harvesting Period: June to July.
(iii) Climate: Zayad crops thrive in warmer conditions and are often grown using irrigation.
(iv) Key Crops: Watermelon, cucumber, muskmelon and fodder crops.
(v) Regions: Predominantly practiced in areas with access to irrigation, such as parts of Uttar Pradesh and Bihar.

6. MAJOR CROPS IN INDIA

Climatic Conditions, Soil Requirements and Methods of Cultivation

6.1 Rice

(i) Climatic Conditions: Warm, humid climate with 100-200 cm of rainfall.
(ii) Soil Requirements: Alluvial, clayey soil with good water retention.
(iii) Cultivation Methods: Transplantation method is common, though some regions

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6. In Subsistence farming, the output is not very high and is consumed within the_____.
(a) village
(b) community
(c) family
(d) state

Ans : MAIN 2000

Thus (c) is correct option.

7. In Subsistence farming, these is a dominance of_____crops and is never any surplus for the_____.
(a) commercial, market
(b) food, market
(c) food, family
(d) plantation, village

Ans : SQP 2001

Thus (c) is correct option.

8. The crops grown in Commercial farming are known as_____.
(a) Beverage crops
(b) Cash crops
(c) Fibre crops
(d) Plantation crops

Ans : COMP 2005

Thus (b) is correct option.

9. Cultivation of crops and raising of animals is a feature of_____.
(a) Intensive farming
(b) Extensive farming
(c) Commercial farming
(d) Plantation farming

Ans : MAIN 2008

Thus (a) is correct option.

10. Commercial farming is prevalent in areas where landholdings are_____and market economy is well developed.
(a) large
(b) small
(c) consolidated
(d) poor in fertility

Ans : COMP 2006

Thus (a) is correct option.

11. _____agriculture is also known as 'slash and burn method'.
(a) Subsistence
(b) Shifting
(c) Intensive
(d) Extensive

Ans : SQP 2011

Thus (d) is correct option.

12. _____and_____crops are associated with Shifting agriculture.
(a) Rice and wheat
(b) Tea and coffee
(c) Yams and tapioca
(d) Jute and cotton

Ans : COMP 2008

Thus (c) is correct option.

13. _____is practised in many areas as an alternative to Shifting cultivation.
(a) Rotation of crops
(b) Intercropping
(c) Nitrogen fixation
(d) Dry farming

Ans : MAIN 2012

Thus (b) is correct option.

14. Intercropping involves growing of two or more crops next to each other at the same_____.
(a) time
(b) space
(c) height
(d) distance

Ans : COMP 2018

Thus (a) is correct option.

15. _____tree plantation is being promoted to check the practice of Shifting cultivation.
(a) Mango
(b) Orange
(c) Apple
(d) Timber

Ans : SQP 2022

Thus (d) is correct option.

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115. Name any two insects that attack cotton.

Ans : MAIN 2009

Boll weevils and wilt attack cotton.

116. What is lint ?

Ans : COMP 2018

The raw-material from which the seeds have been removed is called lint.

117. Why is jute called the "golden fibre" ?

Ans : SQP 2016

Jute is known as golden fibre because of its colour and because of its economic importance as it earns foreign exchange.

118. Name the three cropping seasons in India.

Ans : SQP 2005

Rabi, Kharif and Zaid.

119. Name the two states where rice is grown as a cash crop. Why ?

Ans : COMP 2007

Punjab and Haryana because here self consumption is very less.

120. What kind of soil is needed for the cultivation of wheat ?

Ans : MAIN 2009

Clay loam soil or black soils or alluvial soil or friable loam. The soil should be able to retain moisture.

121. Name the crop which is being planted. Give one benefit of this method of planting this crop

Ans : SQP 2018

Rice, The process of transplantation allows better penetration of the roots in the soil.

122. Name of one state in North and one in South India where sugarcane is grown extensively

Ans : COMP 2004

Uttar Pradesh in the north and Tamil Nadu in the south are the states which produce sugarcane in large quantities.

123. Mention two different ways in which sugarcane is propagated.

Ans : COMP 2007

(i) Sett method
(ii) Ratoon method.

124. State the leading producer of sugarcane in India.

Ans : MAIN 2004

Uttar Pradesh is the leading producer of sugarcane in India.

TWO MARKS QUESTIONS

125. State any two steps being taken by the government to discourage shifting cultivation.

Ans : MAIN 2024

It poses a significant threat to the environment by accelerating soil erosion and contributing to floods and silting in the lower parts of river floodplains. Additionally, the burning of vegetation releases higher levels of greenhouse gases into the atmosphere.

126. Why is agriculture considered an important sector of Indian economy? (Any two points)

Ans : MAIN 2024

Agriculture considered an important sector of Indian economy due to following reasons :

1. Agriculture also supports livestock rearing by providing suitable environmental conditions and fodder. With over 60% of India's land being arable, about 70% of rural families depend on agriculture for their livelihood.
2. Agriculture generates employment for millions of people. It is the largest private sector occupation, providing jobs to approximately 58.4% of the country's workforce.

127. Give two points of difference between Plantation and Mixed Farming.

Ans : MAIN 2024

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26. The crops which are raised throughout the year are known as_____.
(a) Kharif
(b) Rabi
(c) Zaid
(d) Baid

Ans : COMP 2023

Thus (c) is correct option.

27. Indian agriculture is largely dominated by_____crops.
(a) food
(b) fibre
(c) cash
(d) spices

Ans : MAIN 2002

Thus (a) is correct option.

28. _____are all kinds of grass-like plants, which have starchy edible seeds.
(a) Cereals
(b) Spices
(c) Beverages
(d) Oilseeds

Ans : SQP 2023

Thus (a) is correct option.

29. India ranks_____in the production of cereals in the world.
(a) first
(b) second
(c) third
(d) fourth

Ans : COMP 2024

Thus (c) is correct option.

30. India is the_____largest producer of rice in the world.
(a) fifth
(b) fourth
(c) third
(d) second

Ans : MAIN 2015

Thus (d) is correct option.

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31. Rice grows best in_____, _____areas.
(a) warms, humid
(b) cold, dry
(c) hot, rainy
(d) hot, dry

Ans : COMP 2014

Thus (a) is correct option.

32. Rice thrives in the_____soils grown along the river banks.
(a) laterite
(b) red
(c) black
(d) alluvial

Ans : MAIN 2013

Thus (d) is correct option.

33. In the dry method of rice cultivation, seeds are sown in rows with drills in areas of_____.
(a) low rainfall
(b) heavy rainfall
(c) moderate rainfall
(d) scanty rainfall

Ans : SQP 2013

Thus (b) is correct option.

34. In a sugarcane, the sugar is stored in its
(a) roots
(b) stem
(c) leaves
(d) fruit

Ans : COMP 2012

Thus (b) is correct option.

35. _____are cutting taken from old plants and planted to grow new canes.
(a) Setts (b) Retts
(c) Ratoons (d) Batoons

Ans : MAIN 2021

Thus (a) is correct option.

36. The second or any other successive crop obtained from the roots of the leftover crop is called
(a) Ratoon (b) Stalk
(c) Stem (d) Cane

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58. The process of growing tea shrubs in nurseries from cutting of high yielding varieties is known as_____.
(a) clonal sapling
(b) clonal planting
(c) clonal cuttings
(d) clonal trimmings

Ans : COMP 2008

Thus (b) is correct option.

59. The tea shrub continues to be productive for about_____years.
(a) 20
(b) 25
(c) 50
(d) 70

Ans : COMP 2019

Thus (c) is correct option.

60. _____variety of tea is greenish brown in colour.
(a) Oolong
(b) Brick
(c) Black
(d) Green

Ans : COMP 2015

Thus (a) is correct option.

61. _____variety of tea is normally area under tea production in the world.
(a) China
(b) Sri Lanka
(c) India
(d) Kenya

Ans : SQP 2019

Thus (c) is correct option.

62. _____has the largest area under tea production in the world.
(a) China
(b) Sri Lanka
(c) India
(d) Kenya

Ans : COMP 2017

Thus (c) is correct option.

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63. _____is the largest producer of tea in India.
(a) Tamil Nadu
(b) Kerala
(c) West Bengal
(d) Assam.

Ans : MAIN 2017

Thus (d) is correct option.

64. Which of the following are non-traditional coffee producing areas?
(a) Andhra Pradesh and Odisha
(b) Kerala and Karnataka
(c) Manipur and Tripura
(d) Bihar and Punjab

Ans : COMP 2018

Thus (a) is correct option.

ONE MARK QUESTIONS

65. What is mixed farming?

Ans : MAIN 2024,2018,2017

Mixed farming involves both crop cultivation and livestock rearing on a single farm to diversify income and increase profits.

66. Mention any one advantage of mixed farming.

Ans : MAIN 2024

Mixed farming helps maintain soil fertility, promotes soil biodiversity, minimizes soil erosion and aids in water conservation.

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67. With reference to tea cultivation, explain the term 'fine pluck'.

Ans : MAIN 2024

Fine pluck in tea cultivation refers to the selective harvesting of only the top two leaves and a bud from the tea plant, ensuring high-quality tea production.

68. Name the Indian state that leads in coffee production.

Ans : MAIN 2024

The Indian state that leads in coffee

Ans : SQP 2006

Thus (c) is correct option.

48. _____is the leading producer of soyabean.
(a) Rajasthan
(b) Maharashtra
(c) Madhya Pradesh
(d) Gujarat

Ans : MAIN 2017

Thus (c) is correct option.

49. Cotton is tropical crop that requires uniformly high _____.
(a) rainfall
(b) temperature
(c) humidity
(d) All of the above

Ans : SQP 2016

Thus (b) is correct option.

50. Cotton plant is extremely sensitive to_____ which can kill the plant and destroy the crop
(a) temperature
(b) rainfall
(c) frost
(d) humidity

Ans : COMP 2020

Thus (c) is correct option.

51. _____soil is ideal for cotton cultivation.
(a) Alluvium
(b) Black
(c) Laterite
(d) Red

Ans : COMP 2012

Thus (b) is correct option.

52. The fibre or lint is separated from the cotton seeds by a process known as_____.
(a) ginning
(b) spinning
(c) pruning
(d) deseeding

Ans : SQP 2018

Thus (a) is correct option.

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53. An inferior substitute for jute which is more coarse and less strong than jute is_____.
(a) Testa
(b) Mesta
(c) Cesta
(d) Jesta

Ans : MAIN 2011

Thus (b) is correct option.

54. The_____soil gives the heaviest yield of Jute
(a) clayey
(b) loamy
(c) siety
(d) sandy

Ans : SQP 2011

Thus (d) is correct option.

55. _____softens the outer bark of jute and facilitates the early removability of the fibre within.
(a) Jetting
(b) Retting
(c) Metting
(d) Netting

Ans : COMP 2015

Thus (b) is correct option.

56. Tea develops most vigorously under_____ and no_____.
(a) sunshine, rains
(b) light shade, dry spells
(c) moisture, high temperature
(d) clear sky, no rains

Ans : MAIN 2001

Thus (b) is correct option.

57. High humidity, heavy_____and morning _____are good for the rapid development of young tea leaves.
(a) dew, fog
(b) rainfall, sunshine
(c) rainfall, dew
(d) shade, fog

Ans : SQP 2006

Thus (a) is correct option.

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Ans : SQP 2004

Thus (a) is correct option.

37. The yield from each successive ratoon crop is _____than the previous one.
(a) better
(b) higher
(c) lesser
(d) worse

Ans : SQP 2005

Thus (c) is correct option.

38. Sugarcane is a_____exhausting crop.
(a) soil
(b) water
(c) nitrogen
(d) oxygen

Ans : COMP 2003

Thus (a) is correct option.

39. Which of the following states is not a major producer of sugarcane?
(a) Kerela
(b) Punjab
(c) Uttar Pradesh
(d) Maharashtra

Ans : MAIN 2013

Thus (c) is correct option.

40. Groundnut contains per cent oil.
(a) 30
(b) 42
(c) 50
(d) 60

Ans : COMP 2015

Thus (b) is correct option.

41. Groundnut oil is extracted from the nuts found in the_____of the plant.
(a) stem
(b) leaves
(c) roots
(d) branches

Ans : COMP 2019

Thus (c) is correct option.

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42. Groundnut crop requires 50 to_____ rainfall.
(a) 100 cm
(b) 150 cm
(c) 200 cm
(d) 250 cm

Ans : COMP 2020

Thus (a) is correct option.

43. India is the_____largest producer of groundnuts in the world.
(a) fifth
(b) fourth
(c) third
(d) second

Ans : MAIN 2013

Thus (d) is correct option.

44. _____is the leading producer of groundnuts in India.
(a) Telangana
(b) Gujarat
(c) Maharashtra
(d) Rajasthan

Ans : SQP 2014

Thus (b) is correct option.

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45. _____oil is obtained from flaxseeds.
(a) Linseed
(b) Rapeseed
(c) Castor
(d) Safflower

Ans : SQP 2003

Thus (a) is correct option.

46. Soyabean has a high_____content.
(a) calcium
(b) protein
(c) zinc
(d) sodium

Ans : COMP 2005

Thus (b) is correct option.

47. Soyabean : Kharif :: Mustard ::_____.
(a) Kharif (b) Zaid
(c) Rabi (d) None of the above

production is Karnataka.

69. Give one advantage of transplantation method of sowing rice.

Ans : MAIN 2023

One advantage of the transplantation method of sowing rice is that it allows the selection of healthy seedlings, which leads to better crop yield.

70. What is 'Ginning'?

Ans : MAIN 2023

Ginning is the process of separating cotton fibers from their seeds.

71. Name any two pulses grown in India.

Ans : MAIN 2023

Two pulses grown in India are Gram and Arhar (Pigeon Pea).

72. What is meant by 'Retting'?

Ans : MAIN 2023

It is a microbiological process that softens the bark, making it easier to remove fibers from the stalk.

73. What kind of soil is required for the cultivation of tea?

Ans : MAIN 2023

Tea can grow in alluvial, mountain and laterite soils and thrives in loamy soils as well.

74. Why is pruning necessary for tea plant?

Ans : MAIN 2023

Pruning is essential for tea plants as removing the central stem promotes the rapid growth of lateral branches, making hand plucking easier.

75. Why is cotton grown as a Kharif crop in India?

Ans : MAIN 2012

Cotton is grown as a Kharif crop in India because it requires warm temperatures and a long growing season, with the monsoon rains providing the necessary moisture for its growth during the Kharif season.

76. Name the two main agricultural seasons of India.

Ans : SQP 2018

Kharif and Rabi

77. Name the state that leads in the cultivation of rice.

Ans : SQP 1994

West Bengal.

78. Name a cash crop which is also a kharif crop.

Ans : COMP 2008

Cotton.

79. Which state in India produces the largest quantity of raw cotton?

Ans : COMP 2001,2010

Gujarat produces the largest quantity of raw cotton.

80. Name two states which are leading producers of wheat in India.

Ans : SQP 2001

Punjab, Uttar Pradesh and Haryana.

81. Name a state which produces short staple food.

Ans : COMP 2012

Uttar Pradesh

82. Which is the largest tea growing country in the world ?

Ans : MAIN 2011

China

83. What is meant by pruning ?

Ans : SQP 2018

Trimming of overgrown branches of tea plant is known as pruning.

84. State the reason for pruning.

Ans : COMP 2017

Pruning is done to keep the shrub at a

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convenient height of about 40 to 50 cm. It encourages the growth of new shoots with softer leaves.

85. Why cotton is a labour intensive crop.

Ans : SQP 2018

Cotton balls are to be plucked manually so it is a labour intensive crop.

86. Give the geographic term for the following : The residue left behind after the crushing of oilseeds.

Ans : MAIN 2015

Oil cake

87. After oil extraction, what other uses can be oilseed be put to ?

Ans : SQP 2000

After oil extraction, oilseed residue foil cake and can be used as a cattle feed and as a fertilizer for plants.

88. Name any two non-edible oil-seeds grown in India.

Ans : SQP 2001

The two non-edible oil-seeds are Linseed and Castor seed.

89. What is meant by the term 'agriculture' ?

Ans : SQP 2006

The use of land in order to grow crops and rear livestock is called agriculture.

90. Name the most important cash crop of West Bengal.

Ans : MAIN 2011

The most important cash crop of West Bengal is Jute.

91. Give one climatic feature that favours its cultivation.

Ans : COMP 2006

One climatic feature that favours its cultivation is temperature of 27°C-35°C and high percentage of humidity and rainfall around 170-250 cm.

92. How long does the jute plant take the mature?

Ans : MAIN 2012

The jute plant takes 4 to 6 months to mature.

93. Name the largest tea growing country in the world.

Ans : SQP 2015

India is the largest tea growing country in the world.

94. Name the state in India that is the largest producer of tea.

Ans : COMP 2013

Assam is the largest producer of tea in India.

95. Name the largest tea-exporting port of India.

Ans : MAIN 2005

Kolkata port is the largest tea-exporting port of India.

96. When and where was the first coffee plantation set-up in India ?

Ans : SQP 2006

The first coffee plantation set-up in India in Karnataka in the year 1830.

97. How are the young coffee plants protected from heat ?

Ans : COMP 2007

The young coffee plants are protected from heat by growing them in the shade of trees.

98. When were rubber plantation first started in India?

Ans : MAIN 2008

Rubber plantations first started in India in the year 1902.

99. What is the advantage of bud grafting in the propagation of rubber plants ?

Ans : SQP 2007

By bud grafting, the characteristics of mother plant are transmitted to the grafted plant.

100. Name the two main centres where tea is auctioned.

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Ans : COMP 2011

North-East India and South India are the two main centres where tea is auctioned.

101. Name two important regions where tea is grown it South India.

Ans : COMP 2016

In South India, tea is grown in Nilgiri and Palni.

102. Name two main varieties of coffee grown in India.

Ans : MAIN 2003

Two main varieties of coffee grown in India are :
(i) Coffee arabica
(ii) Coffea robu

103. Why are youn coffee plants protected from heat ?

Ans : MAIN 2009

The youn coffee plants are protected from heat because the direct rays of the sun are injurious to the coffee plant.

104. With reference to the type of soil only state, why Ragi is grown in Tamil Nadu ?

Ans : SQP 2005

Ragi is grown in Tamil Nadu due to its inferior alluvial soil.

105. What are millets ?

Ans : MAIN 2015

Several species of the grass family such as Jowar, Bajra and ragi have been given a common name called 'millets'.

106. What are the uses of maize besides as an article of food ?

Ans : SQP 2023

Besides as an article of food, maize is also used as fodder for cattles.

107. Name three states of India where maize is cultivated extensively.

Ans : MAIN 2009

Maize is cultivated extensively in Bihar, Uttar Pradesh and Punjab.

108. Name any three millets.

Ans : COMP 2013

The three millets are Jowar, Bajra and Ragi.

109. In which state in South India rice is grown extensively. Why?

Ans : COMP 2011

Tamil Nadu is an important producer of rice. About 75 per cent of the produces is contributed by Thanjaner South Arcot, Chingleput. North Arcot and Madurai.

110. What do you understand by the term 'cereals'?

Ans : SQP 2008

The term 'cereals' denotes all types of grass like plants, which have starchy edible seeds.

111. What kind of soil is needed for the cultivation of millets ?

Ans : MAIN 2004

As far as soil is concerned millets, do not have any special requirements but loamy sandy and clayey deep regur and alluvium are best suited.

112. What improved method of cultivation can help raise rice production in India?

Ans : COMP 2008

The Japanese method of cultivation can help to raise the rice production in India.

113. Name three states leading in the production of wheat.

Ans : SQP 2002

Punjab, Haryana and Uttar Pradesh is the leading producer of wheat in India.

114. Name two states which produce long staple cotton.

Ans : SQP 2004

Punjab and Haryana.

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16. _____type of farming involves cultivation of small farms using large inputs of labour, manures and fertilizers.
(a) Extensive
(b) Shifting
(c) Intensive
(d) Commercial

Ans : COMP 2019

Thus (c) is correct option.

17. Which type of agriculture is mainly practised in the irrigated areas of the plains of northern India and the coastal area of south India?
(a) Plantation
(b) Shifting
(c) Extensive
(d) Intensive

Ans : MAIN 2013

Thus (d) is correct option.

18. The input of labour per unit area is low in_____farming.
(a) Extensive
(b) Intensive
(c) Plantation
(d) Subsistence

Ans : COMP 2015

Thus (a) is correct option.

19. _____farming is an eco-friendly method as it involves less use of chemical fertilizers.
(a) Subsistence
(b) Commercial
(c) Intensive
(d) Extensive

Ans : SQP 2004

Thus (d) is correct option.

20. A plantation is usually a_____over a large area which does not include naturally occurring plants.
(a) monoculture
(b) apiculture
(c) horticulture
(d) arboriculture

Ans : COMP 2009

Thus (a) is correct option.

21. The farming which involves cultivation of single agricultural crop over large tracts of land or estates is_____.
(a) Subsistence agriculture
(b) Commercial agriculture
(c) Plantation farming
(d) Mixed farming

Ans : MAIN 2016

Thus (a) is correct option.

22. Tea, coffee, rubber or spices are crops.
(a) Plantation farming
(b) Intensive farming
(c) Extensive farming
(d) Commercial farming

Ans : COMP 2018

Thus (a) is correct option.

23. _____crops are associated with the south-west monsoon.
(a) Rabi
(b) Kharif
(c) Zayad
(d) None of the above

Ans : SQP 2011

Thus (b) is correct option.

24. Which of the following is not a kharif crop?
(a) Sugarcane
(b) Cotton
(c) Rice
(d) Wheat

Ans : COMP 2015

Thus (d) is correct option.

25. The kharif crops are sown in June and July and harvested in_____and_____
(a) September and October
(b) October and November
(c) March and April
(d) August and September

Ans : SQP 2022

Thus (a) is correct option.

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Aspect	Plantation Farming	Mixed Farming
Type of Crops/ Livestock	Cultivates a single cash crop (e.g., tea, coffee)	Involves both crop cultivation and livestock rearing
Scale and Purpose	Large-scale commercial farming, often for export	Smaller scale, used for subsistence and income generation from both crops and livestock

128. Differentiate between Intensive farming and Extensive farming.

Ans : MAIN 2023

Differentiate between Intensive farming and Extensive farming :

Intensive Farming	Extensive Farming
Practiced on small land areas with high inputs.	Practiced on large land areas with low inputs.
High yields per hectare.	Lower yields per hectare.
Common in densely populated regions.	Common in sparsely populated regions.

129. Mention two problems faced by the Indian farmers.

Ans : MAIN 2023

Mention two problems faced by the Indian farmers :

(a) Dependence on unpredictable monsoon : Farmers often rely on rainfall, which can be erratic, leading to droughts or floods.

(b) Small land holdings : Many farmers have fragmented and small plots of land, which limits productivity and efficient farming practices.

130. What is plantation agriculture ?

Ans : COMP 2009,2014

Plantation farming involves large-scale cultivation of a single crop, similar to factory production. It is typically marked by expansive estates, substantial capital investment and the use of modern, scientific farming techniques. Examples include tea and coffee plantations.

131. Name a crop cultivated in India:
(i) During the Kharif season.
(ii) During the Rabi season.

Ans : COMP 1995

(i) Kharif season crop : Rice
(ii) Rabi season crop : Wheat

132. Name the months when the Kharif crops are :
(a) Sown
(b) Harvested.

Ans : COMP 2004, 2008

(a) Sown : Kharif crops are sown between June and July.

(b) Harvested : Kharif crops are harvested between October and November.

133. What are the two methods of cultivation of rice? Which one is known for its better yields?

Ans : SQP 2002

Two methods of cultivation of rice :
(i) Sowing
(ii) Transplanting
The transplantation method is known for its better yields because it allows for better spacing of plants and more effective weed control, leading to healthier crops.

134. Why should the production of pulses be increased? Give two reasons.

Ans : MAIN 2015, 2018

The production of pulses should be increased due to following reasons :

1. Nutritional value : Pulses are a rich source of protein and essential nutrients, making them an important part of a balanced diet, especially in regions where meat is not widely consumed.
2. Soil fertility : Pulses are nitrogen-fixing crops, meaning they help enrich soil

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fertility by naturally adding nitrogen, reducing the need for chemical fertilizers.

135. Name the months when the kharif crops are sown and harvested.

Ans : SQP 1993

Kharif crops are sown during June and July and harvested in October and November.

136. Which are the two staple food crops of India? Name against each the agricultural season in which it is grown.

Ans : SQP 1993

The two staple food crops of India are:
1. Rice : Grown during the Kharif season.
2. Wheat : Grown during the Rabi season.

137. State the three coarse grains (millets) grown in India. Name two states where these are grown on a large scale.

Ans : COMP 1993

The coarse grains grown in India include Jowar, Bajra and Ragi. Ragi is cultivated in Tamil Nadu and Karnataka, while Bajra is primarily grown in Karnataka and Maharashtra. Ragi is also produced in Maharashtra, Gujarat and Rajasthan.

138. Mention two features of subsistence agriculture.

Ans : COMP 2008

(i) Farmers grow crops primarily for their own consumption, rather than for sale in the market.
(ii) It is labor-intensive, relying heavily on manual labor and traditional farming methods.

139. With reference to rice cultivation, answer the following :
(i) Name two leading states in the production of rice.
(ii) Give two advantages of growing rice in nurseries.

Ans : COMP 2008, 2013

(i) West Bengal and Andhra Pradesh.
(ii) Two advantages of growing rice in nurseries :
1. Transplantation allows for deeper root penetration, enabling the plants to establish more firmly in the soil.
2. Transplantation significantly enhances crop yield by ensuring healthier, stronger plants that are better spaced and less susceptible to weeds.

140. How has poverty and fragmentation of land become problems of agricultural India ?

Ans : COMP 2014

(i) Fragmentation of land and poverty prevent farmers from affording modern inputs such as fertilizers, high-yield variety (HYV) seeds and pesticides.
(ii) Poverty limits farmers' ability to invest in modern machinery like tractors and harvesters, resulting in low per hectare productivity.

141. What is Zayad/Zaid cropping season ?

Ans : MAIN 2022

In addition to rabi and kharif crops, farmers cultivate an additional crop during the summer months of April, May and June, right after the rabi harvest. This is known as the Zaid season. The crop season is short and it primarily includes the cultivation of fruits and vegetables.

142. (i) Name once important plantation crop.
(ii) Explain two important characteristics of plantation farming with reference to the crop named above.

Ans : COMP 1995

(i) Tea is a plantation crop.
(ii) Two important characteristics of plantation farming with reference tea crop are :
(a) Plantation farms are typically large, with the size of the farm ranging from 5 to 40 hectares.
(b) These farms employ a large workforce, as the cultivation and processing of crops require significant labor.

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143. Mention a leading beverage crop of India. What are its requirements in terms of soil and rainfall ?

Ans : SQP 2008

A leading beverage crop of India is tea. Soil and rainfall requirements of tea are :

(i) Soil requirements : Tea requires well-drained, acidic soil rich in organic matter.

(ii) Rainfall requirements : Tea grows best in regions with heavy and evenly distributed rainfall, typically between 150 to 250 cm annually.

144. State two important aspects of the Japanese method of rice cultivation.

Ans : SQP 2006

1. Transplantation : Rice seedlings are first grown in nurseries and then transplanted to the main field, ensuring better plant spacing and healthier growth.
2. Use of fertilizers : The Japanese method emphasizes the use of high-quality fertilizers and nutrients to enhance crop productivity and increase yields.

145. What is meant by the term 'oilcake' ?

Ans : COMP 1998, 2001, 2010

Oilcake refers to the solid residue left after oil is extracted from oilseeds, such as mustard, groundnut, or soybean. It is commonly used as animal feed or as an organic fertilizer due to its high nutrient content.

146. Name the state where rice is grown almost exclusively as a cash crop. What makes rice the staple food crop of India ?

Ans : MAIN 2011

West Bengal is the state where rice is mainly grown as a cash crop. Rice is the staple food of India due to its adaptability to various climates, high yield and being a major source of carbohydrates for the population.

147. What are the geographical requirements of sugarcane ?

Ans : SQP 2002, 2017

1. Climate : Sugarcane thrives in hot and humid climates, with an ideal temperature range of 20°C to 30°C.
2. Rainfall : It requires 75 to 150 cm of well-distributed rainfall, or adequate irrigation in dry areas.
3. Soil : Sugarcane grows best in deep, fertile, well-drained loamy soil rich in organic matter.
4. Growing season : A long, sunny growing season of 8 to 10 months is needed for optimal growth.

148. The yield of sugarcane is higher in the Deccan'. Give reason.

Ans : MAIN 2015

(a) The sugar content in sugarcane is higher in the southern states due to ideal climatic conditions, such as warmer temperatures and better irrigation systems.

(b) Favourable geographical conditions, including fertile soil, adequate rainfall and longer growing seasons, contribute to increased crop yield.

149. "India has very large area under sugarcane cultivation but still the production is less as compared to Cuba". Give reason.

Ans : COMP 2010

(a) The sugarcane grown in India is typically of the thin variety with a lower sugar content, leading to reduced overall sugar production.

(b) The sugar industry in India has not fully developed due to factors like outdated technology, inefficient processing and limited modernization in farming and production techniques.

150. Why must the sugar mills be near the sugar fields?

Ans : SQP 2010

Sugar mills must be located near sugar fields because sugarcane is a perishable crop that begins to lose its sugar content soon after harvesting. Proximity to the fields ensures that the cane can be processed quickly,

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preserving its sugar quality and maximizing production efficiency. This also reduces transportation costs and prevents spoilage.

151. Why is a lot of labour required for its cultivation?

Ans : COMP 2010

A lot of labor is required for sugarcane cultivation because it is a labor-intensive crop that involves multiple stages, such as planting, weeding, irrigating and harvesting, which often need to be done manually. Additionally, sugarcane harvesting requires precision and is typically done by hand, further increasing the demand for labor.

152. 'Which state is the leading producer of jute'? Give any two factors responsible for this.

Ans : SQP 2009

West Bengal is the leading producer of jute because :

1. The region experiences heavy and evenly distributed rainfall (170 cm - 200 cm), which is essential for jute cultivation.
2. Alluvial soil in the Ganga-Brahmaputra delta is ideal for jute, as the plant thrives in this soil and regular flooding helps replenish nutrients, compensating for the fact that jute is a soil-exhausting crop.

153. Which is the most important and widespread fibre crop of India. What kind of soil is suited to this crop and why ?

Ans : MAIN 1996

Jute is a significant and widespread fiber crop in India. Being a soil-exhausting crop, it requires the soil to be replenished annually. In the Ganga-Brahmaputra delta, annual floods deposit fresh layers of alluvium, renewing the soil and creating ideal conditions for jute cultivation.

154. Why is agriculture called the main stay of Indian economy ?

Ans : SQP 2018

Agriculture is the backbone of the Indian economy, as 67% of the population relies on it either directly or indirectly. It provides essential raw materials for industries, generates foreign exchange through exports of agricultural products and contributes 30% to the nation's income.

155. Write two differences between intensive and extensive farming.

Ans : COMP 2003, 2013

Aspect	**Intensive Farming**	**Extensive Farming**
Method of Increasing Production	Production is increased by using higher inputs such as fertilizers, irrigation and modern techniques.	Production is increased by bringing more land under cultivation.
Location	Practiced in densely populated areas where additional land is not available for expansion.	Practiced in sparsely populated areas where more land is available.

156. Which are two factors according to you responsible for the low yields of crops per hectare in India ?

Ans : SQP 2003, 2010

(i) Traditional farming methods : Many farmers still rely on outdated techniques and lack access to modern agricultural tools and technologies.

(ii) Soil depletion: Continuous farming without proper soil management has led to decreased soil fertility, impacting crop productivity.

157. Mention two problems faced by the agricultural sector of India.

Ans : COMP 2022

1. Fragmentation of landholdings : Due to inheritance and population growth,

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agricultural land is divided into smaller, less productive plots, making efficient farming difficult.

2. Inadequate irrigation : A large portion of farmland depends on erratic monsoon rains, leading to water shortages and inconsistent crop yields.

158. Why is cotton grown widely in the deccan plateau?

Ans : SQP 2004

Cotton is widely grown in the Deccan Plateau because :

(i) Favorable climate : Cotton requires a warm climate with temperatures between 21°C to 27°C and abundant sunshine during its growth. These conditions are prevalent in the Deccan Plateau.

(ii) Soil : Cotton thrives in black soil, which is found in most parts of the Deccan Plateau, providing the necessary nutrients and moisture retention for the crop.

159. Why is tea considered a labour intensive crop? Name two states where it is grown.

Ans : COMP 2004

Tea is considered a labour-intensive crop because key activities like sowing, pruning and plucking require a significant number of both skilled and unskilled workers.

160. Give the geographical conditions required for the production of cotton.

Ans : MAIN 2006, 2012

1. Climate : Warm temperatures between 21°C to 27°C with abundant sunshine.
2. Rainfall : Moderate rainfall of 50 to 100 cm or irrigation in drier areas.
3. Soil : Grows best in well-drained black soil.
4. Growing season : Requires a long, frost-free period of 6 to 8 months.

161. What is the importance of agriculture in India? Mention two factors.

Ans : SQP 2012

(i) Agriculture is the mainstay of the Indian economy as about 67% of the population depends on it directly or indirectly.

(ii) It supplies essential raw materials to industries, supporting sectors like textiles, food processing and more.

162. State two reasons to explain why the cultivation of oil seeds is lagging behind in recent times.

Ans : COMP 2003

The major reasons for the decline in oilseed cultivation in recent times are:

(i) Increased vegetable oil imports, which reduce the demand for domestically produced oilseeds.

(ii) Drought conditions, which negatively impact the growth and yield of oilseed crops.

163. Which oilseed is inedible by man ? State any two uses of its oil.

Ans : MAIN 2000

The oilseed castor is inedible by humans.
Two uses of castor oil:

1. Industrial use: Castor oil is used as a lubricant in machinery and engines.
2. Pharmaceutical use: It is used in medicines, particularly as a laxative and in skincare products.

164. State the soil and water requirements of jute and name the state which is the leading producer of jute.

Ans : COMP 1993

Jute requires 175-200 cm of rainfall and clean, soft water for the retting process. It thrives in friable alluvial soil, rich in salts, or in sandy and loamy soils. West Bengal is the leading producer of jute in India.

165. Mention any two problems of agriculture in India.

Ans : SQP 2000

1. Indian agriculture is mainly subsistence-based, utilizing extensive manual labor to produce just enough food for family consumption, with only a minimal surplus

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including biodiversity, biological cycles and soil biological activity. This is achieved through the use of on-farm agronomic, biological and mechanical methods, while completely avoiding synthetic, off-farm inputs."

200. What is Cooperative farming ?

Ans : SQP 2021

Cooperative farming is a collaborative farming initiative aimed at tackling shared challenges and ensuring mutual benefit. While each farmer retains individual ownership of their land, all farming activities are conducted collectively with other farmers. The profits are distributed based on the proportion of land owned by each member-farmer.

201. What is meant by the term Ratooning ?

Ans : MAIN 2008

Ratooning is the practice of allowing the stubble or lower part of a harvested plant to grow a second crop from its existing root system. It saves time and effort, commonly used with crops like sugarcane, though it often results in lower yields than the initial crop.

202. What is meant by the term Retting.

Ans : SQP 2011

Retting is a microbiological process where jute stems are immersed in soft, flowing water to loosen the outer bark, making it easier to separate the fibers from the stalk.

203. State three factors which favour the growth of tea in Assam.

Ans : COMP 2003

Three factors that favor the growth of tea in Assam are as follows:

(i) The hilly slopes ensure excellent drainage.
(ii) Ample rainfall is well-distributed throughout the year.
(iii) The well-drained, light loamy soil with optimal pH levels supports tea cultivation.

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204. In which region is ragi grown in India? Why?

Ans : SQP 2017

Ragi is one of the most resilient crops, capable of thriving in areas with minimal rainfall and enduring extreme drought. It is commonly cultivated in regions with an average annual rainfall of 50 cm to 100 cm and temperatures ranging from 20°C to 30°C. Major growing areas include West Bengal, Uttar Pradesh, Andhra Pradesh, Punjab and Tamil Nadu.

205. In which part of the year is wheat grown in India ? Why ?

Ans : MAIN 2000

Wheat is cultivated during the winter season in India as it thrives in the favorable climatic conditions of this period. It is the main crop of the rabi or winter season, benefiting from light rainfall during its growth phase, which is brought by western disturbances, retreating monsoons and northeast monsoon winds.

206. Why is wheat not grown in the eastern and in the extreme southern parts of India ? Name the state that is the largest producer of wheat.

Ans : COMP 2005

Wheat is not cultivated in the eastern and extreme southern parts of India because the temperature in these regions does not drop to the necessary level for its growth. Wheat requires temperatures between 10°C and 15°C, which are not typically met in these areas. Uttar Pradesh is the largest wheat-producing state in India..

207. Which is a useful 'rotation crop' ? Give reasons to support your answer.

Ans : SQP 2003

Leguminous crops, such as pulses (e.g., peas, beans, lentils), are valuable rotation crops.
Reasons :

1. Nitrogen Fixation : These crops fix nitrogen in the soil through bacteria in their root nodules, enriching soil fertility.
2. Soil Health : By enhancing soil fertility, leguminous crops promote healthier soil,

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175. State three factors which favour the cultivation of coffee in south India. Name the leading producer of coffee in India.

Ans : SQP 1999

Three factors favoring coffee cultivation in South India:

1. Warm, humid climate (15°C to 28°C).
2. Well-distributed rainfall (125 to 200 cm).
3. Hilly terrain in the Western Ghats provides good drainage.

176. With which crop do you associate Ratooning?

Ans : COMP 1998

Ratooning is a method used in sugarcane cultivation, where the cane is cut close to the ground after the first harvest. After a few days, the plant begins to regrow, producing a second crop known as the ratoon. This technique is commonly associated with the sugarcane crop.

177. Which are the two most important oilseed crops of India? State the crop season and the major areas in which each one of them is grown ?

Ans : COMP 2008

1. Groundnut :
   (i) Crop season : Kharif season (June to October)
   (ii) Major areas : Grown in Gujarat, Andhra Pradesh, Tamil Nadu and Maharashtra.
2. Mustard :
   (i) Crop season : Rabi season (October to April)
   (i) Major areas : Grown in Rajasthan, Haryana, Punjab and Uttar Pradesh.

178. Mention two problems faced by the sugarcane cultivators in India and state the role of the Central Government in solving these problems.

Ans : SQP 2005

Two problems faced by sugarcane cultivators in India:

(i) Low yield and poor quality : Traditional farming methods and lack of access to modern technology result in lower yields and poor quality sugarcane.

(ii) Delayed payments : Farmers often face delays in payments from sugar mills, causing financial strain.

Role of the Central Government :

(i) The government provides subsidies for inputs like fertilizers, seeds and irrigation to reduce production costs.

(ii) The government enforces regulations to ensure sugar mills make timely payments to farmers and implements schemes like the Fair and Remunerative Price (FRP) to secure farmers' incomes.

179. What conditions of soil and climate are suitable for the cultivation of maize ?

Ans : COMP 2007

(i) Soil conditions for maize cultivation:
   (a) Maize grows best in well-drained, fertile loamy soil with good organic content.
   (b) The soil should have a neutral pH (6.5 to 7.5) for optimal growth.

(ii) Climate conditions for maize cultivation:
   (a) Maize requires a warm climate with temperatures ranging between 21°C to 27°C.
   (b) It needs moderate rainfall of about 60 to 100 cm, but it is sensitive to waterlogging and frost.

180. Is maize a rabi or kharif crop ? Name three leading producers of maize ?

Ans : MAIN 2004

Maize is primarily a Kharif crop, but in Tamil Nadu, it is cultivated as a Rabi crop. Therefore, it is grown in both Rabi and Kharif seasons. The leading producers of maize are Uttar Pradesh, Odisha and Madhya Pradesh.

181. Why are the millets so widely grown ?

Ans : SQP 2008

Millets, being part of the grass family, do not have specific soil requirements. They thrive in warm weather and can grow with minimal rainfall, making them widely cultivated due to their adaptability to various conditions.

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182. Why is the yield of sugarcane higher in the Deccan?

Ans : COMP 2003

The higher yield of sugarcane in the Deccan is due to :
(i) Favorable geographical conditions and
(ii) The implementation of modern scientific cultivation methods.

183. What is meant by agro-industry ?

Ans : MAIN 2000

Agro-industry refers to industries that process and transform agricultural products into finished goods or value-added products. This includes activities like processing crops, livestock and other raw materials produced by agriculture into food products, textiles, beverages and other goods.

184. Discuss the drug obtained from the annual castor plant and its properties.

Ans : SQP 2005

The drug obtained from the annual castor plant is castor oil, which is extracted from the seeds of the plant.
Properties :
(i) Laxative : Used to relieve constipation.
(i) Anti-inflammatory : Moisturizes skin and reduces inflammation.
(iii) Antimicrobial : Helps treat minor infections.
(iv) Lubricant : Used in machinery due to its high viscosity.

185. Name the non-edible oil seeds. Why are they so called?

Ans : COMP 2013

Non-edible oil seeds include castor, neem and jatropha.
They are called non-edible because the oil extracted from these seeds is not safe for human consumption due to the presence of toxic compounds or their industrial uses. These oils are primarily used in products like lubricants, biodiesel, soaps and cosmetics rather than for cooking or food.

186. Give two reasons stating the economic importance of the tea industry.

Ans : MAIN 2005

(i) Being labour-intensive, it provides employment to over a million workers.
(ii) The tea industry significantly contributes to the country's economy by earning substantial foreign exchange.

187. Why is jute called the "brown paper bag of wholesale trade" ?

Ans : SQP 2007

Jute is referred to as the "brown paper bag of wholesale trade" because jute fabric is extensively used for packaging various agricultural and industrial products, such as rice, wheat, cotton bales, cement and fertilizer.

188. What is meant by "Retting "?

Ans : COMP 2019

Retting is a microbiological process used in jute processing, where the outer bark of the jute stalk is loosened, making it easier to separate the fibers from the stalk.

189. Describe the appearance of a fully-grown jute plant.

Ans : MAIN 2009

The fully-grown jute plant typically reaches a height of 2-4 meters and resembles a spear. The stem is about 1 inch thick, with a few branches emerging near the top. The fiber is extracted from the inner bark of the stem.

190. Where in India does long staple cotton grow?

Ans : COMP 2010

In India, long staple cotton is cultivated in Punjab, Haryana, Maharashtra, Tamil Nadu and Andhra Pradesh.

191. What is meant by Green Revolution ?

Ans : MAIN 2010

The Green Revolution refers to the significant rise in India's agricultural production and productivity, particularly in major cereal

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crops like wheat, following the adoption of the New Agricultural Strategy in the late 1960s.

192. State the economic importance of the tea industry in India.

Ans : SQP 2017

The economic significance of the tea industry in India includes the following:

(i) As one of the largest tea producers, India earns a significant portion of its foreign exchange through tea exports.

(ii) Tea plantations and the industry provide employment to millions of men and women.

(iii) The tea industry supports related sectors such as fertilizer, plywood and transport industries.

193. Mention the problems associated with coffee cultivation in India.

Ans : MAIN 2013

The problems related to coffee cultivation in India are:

(i) The current yield of coffee per hectare is relatively low.

(ii) The quality of coffee varies based on climatic factors and other environmental conditions.

194. State any two characteristics of Green Revolution.

Ans : COMP 2018

(i) The use of large capital and technological inputs to enhance agricultural productivity.

(ii) The adoption of modern scientific farming methods to improve efficiency and yields.

195. State any two advantages of Commercial farming.

Ans : MAIN 2023

1. Higher productivity and profitability: Commercial farming focuses on large-scale production, leading to higher yields and profitability due to the use of advanced technology, better seeds and machinery.
2. Contribution to the economy: It helps in generating significant revenue for the country by producing surplus crops for export, supporting economic growth and development.

196. Agriculture in India is a gamble on the monsoon. Explain.

Ans : SQP 2018

The agricultural prosperity of India heavily relies on timely and well-distributed rainfall. When the monsoon fails, agriculture suffers significantly, which is why Indian agriculture is often referred to as a gamble dependent on the monsoon. A poor summer monsoon can lead to famines and food shortages, making the monsoon a crucial factor for Indian farmers.

197. How is shifting cultivation carried out ?

Ans : COMP 2015

It is an ancient agricultural method where a section of forest is cleared by cutting down trees and burning the stumps. The cleared area is farmed for several years until the soil's fertility is significantly depleted.

198. Where is shifting cultivation practised in India? State any one disadvantage of shifting cultivation.

Ans : SQP 2020

Shifting cultivation is practiced in the northeastern states of India, such as Assam, Meghalaya, Nagaland, Mizoram, Manipur, Tripura and Arunachal Pradesh.

One disadvantage of shifting cultivation is that it leads to deforestation and soil erosion, as repeated clearing and burning of forests degrade the land over time, reducing its ability to support vegetation and increasing environmental degradation.

199. What is Organic farming ?

Ans : COMP 2021

"Organic agriculture is a distinctive production system aimed at promoting and improving the health of agro-ecosystems,

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available for sale in the market.
2. A large part of India's soil has been degraded because it has been continuously ploughed for the past 4,000 to 5,000 years.

166. What is meant by 'pruning' ? State the reason for pruning.

Ans : SQP 2003

Pruning refers to the removal of the central leading stem to shape the tea plant into a small bush. This process encourages the growth of new shoots, resulting in softer, tender leaves.

167. Write a short note on upland rice.

Ans : COMP 2005

Upland rice is cultivated in hilly regions and is typically sown in March or April, with harvesting occurring in September-October. This type of agriculture relies solely on rainfall distribution. The crop takes about six months to mature and is primarily grown for local consumption.

168. How are the pulses harvested in India ?

Ans : MAIN 2006

Pulses are often rotated with other crops because, as leguminous plants, they have the ability to fix atmospheric nitrogen in the soil. This process helps to naturally enhance soil fertility, benefiting subsequent crops.

169. What kind of soil is needed for the cultivation of wheat ?

Ans : MAIN 2008

Suitable soils for cultivation include clay loam, black soils, alluvial soils and friable loam. These soil types are preferred because they have the ability to retain moisture effectively, ensuring that the crops receive the necessary water for optimal growth.

170. State the climatic conditions suitable for the cultivation of pulses.

Ans : SQP 2012

1. Soil: Pulses or gram can be grown in dry, light soils that are well-suited for their cultivation.
2. Climate: Pulses or gram thrive in high temperatures, ranging from 20°C to 30°C and can grow well with low to moderate rainfall of 50 cm to 75 cm.

171. Why is South India in a better position for production of tea ?

Ans : SQP 2015

South India is well-suited for tea production due to its favorable climate and the sloping terrain of the Nilgiri Hills, which provide ideal conditions for tea cultivation.

172. What is the main use of processed jute ? What other uses have been found for the crop?

Ans : COMP 2017

The main use of processed jute is for making sacks and bags used for packaging agricultural products like rice, wheat and pulses.
Other uses of jute include :
1. Textiles : Jute is used in the production of carpets, rugs and curtains.
2. Furniture and handicrafts : It is used to make furniture upholstery, decorative items and handicrafts.
3. Geotextiles : Jute is used in geotextiles for soil erosion control and road construction.

173. Why must cotton bolls be picked immediately?

Ans : SQP 2006

Cotton bolls must be picked immediately to prevent destruction by birds or pests such as boll weevils, bollworms and wilt, which can significantly damage the crop.

174. What two conditions favour the growth of tea in the Nilgiris ?

Ans : MAIN 1999

1. The Nilgiris' temperature range of 27° to 35°C and rainfall of 150 to 300 cm create ideal climatic conditions for tea cultivation.
2. The region's red and yellow, well-drained soils, along with frost-free hill slopes, further support the growth of tea.

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benefiting future crops in the rotation.

208. What extra care needs to be taken for soil health sugarcane is cultivated ?

Ans : COMP 2009

Sugarcane depletes the soil's fertility, so it is necessary to supplement the soil with organic manures and nitrogenous fertilizers to restore its nutrient balance.

209. Give two climatic factors that favour the cultivation of coffee.

Ans : SQP 2007

1. Temperature : Coffee grows best in a moderate climate with temperatures ranging between 15°C to 28°C. Extreme heat or cold can damage the crop.
2. Rainfall : Coffee requires adequate rainfall of about 125 cm to 250 cm annually, evenly distributed throughout the year, with a dry period for ripening.

210. Name the three varieties of coffee plants grown on commercial scale in India. Name one state where coffee is grown extensively.

Ans : MAIN 2020

The three varieties of coffee plants grown on a commercial scale in India are Arabica, Robusta and Liberica, with Karnataka being a state where coffee is extensively cultivated.

211. State any two conditions that favour the growth of tea in the Nilgiris.

Ans : SQP 2004

Two conditions that favor the growth of tea in the Nilgiris are as follows:

(i) The Nilgiri Hills receive rainfall year-round.

(ii) The hilly slopes offer excellent drainage.

212. State the advantages of growing tea plants on hill slopes.

Ans : COMP 2006

1. Tea is grown on hill slopes to prevent waterlogging, which is detrimental to the growth of tea bushes.
2. Hill slopes provide well-drained, deep and friable loamy soils, ideal for tea cultivation.

213. Define the following terms :

(a) Clonal Planting

(b) Pruning.

Ans : MAIN 2014

(a) Clonal planting is utilized in tea cultivation by taking cuttings from a mother plant and growing them into new tea shrubs. This method ensures that the new plants produce tea of the same superior quality as the original mother plant.

(b) Pruning involves the selective removal of branches from a tree. The objectives are to eliminate unwanted branches, improve the tree's structure and encourage the growth of new, healthy branches.

214. Name the leading producer of tea in India. State two factors that have helped it to become the leading state in tea production

Ans : SQP 2016

The leading producer of tea in India is Assam.

1. Assam's abundant rainfall, exceeding 250 cm annually, creates highly favorable conditions for tea cultivation.
2. The region's warm temperatures, consistently above 20°C, contribute to Assam's success as the leading tea-producing state.

215. Why is mesta an inferior substitute for jute ? Where is it growth ?

Ans : COMP 2012

Mesta is considered an inferior substitute for jute because its fibers are coarser, less durable and of lower quality compared to jute. This makes mesta less suitable for producing high-quality textiles and products that require fine, strong fibers like those made from jute. Mesta cultivation is undertaken in some parts of Assam, Bihar, Odisha and Kerala.

216. State the soil conditions that favour the growth of jute.

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expertise to manage these operations efficiently and to market the produce internationally.

(ii) In shifting cultivation, soil fertility is quickly exhausted due to continuous cropping. Therefore, fields are rotated to allow the soil to naturally regain nutrients while a new patch of land is cleared for cultivation.

(iii) Agriculture prioritizes boosting production by utilizing the natural fertility of the soil, favorable climate and suitable terrain. This approach is implemented on large-scale farms to achieve higher overall yields. As a result, total crop production is substantial due to extensive landholdings, although the yield per unit area remains relatively low.

Key Features :

(a) Large Farm Size: Farms are typically expansive in size.

(b) Use of Machinery: Agricultural machinery is extensively utilized in farming practices.

(c) Crop Specialization: Farmers focus on cultivating one or two major commercial crops.

244. (i) What type of farming is practised in areas where population is sparse and land is in plenty ?

(ii) Name two areas in India where such type of farming is practised ?

Ans : MAIN 2018

(i) Extensive farming is carried out on large farms using machinery, with minimal labor input per unit area. The focus is on maximizing production and the main crops cultivated include rice, wheat and sugarcane.

(ii) This type of farming is practiced in the Terai region of the Sub-Himalayas and in parts of North-Western India.

245. What is Subsistence farming ? Mention two features of Subsistence farming

Ans : MAIN 2019

Subsistence farming is a type of agriculture where farmers grow crops primarily to meet the needs of their family or local community, with little to no surplus for trade or sale.

Two features of subsistence farming:

1. Small Land Holdings : It is usually practiced on small plots of land, with minimal use of modern technology and inputs.
2. Low Productivity : The primary goal is self-sufficiency, so the output is often limited, with little surplus for market sale. The focus is on staple crops needed for the farmer's own consumption.

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246. State why is organic farming gaining popularity in recent times.

Ans : SQP 2015

Organic farming is becoming popular due to:

1. Health Benefits : It produces chemical-free, healthier food.
2. Environmental Sustainability : It promotes eco-friendly practices that protect soil and biodiversity.
3. Increased Demand : Growing awareness about health and the environment has increased demand for organic products.

247. Define the benefits of the 'New Strategy in Indian Agriculture'.

Ans : SQP 2019

The Intensive Agriculture Development Programme (IADP), also known as the Green Revolution, aimed to increase food production to meet the growing population's needs. Key measures include:

(i) Introduction of high-yield seeds to boost food crop production.

(ii) Development of irrigation facilities to withstand drought.

(iii) Use of fertilizers to enhance crop yield.

(iv) Provision of rural electrification, agricultural credit and other farmer support services.

(v) Establishment of agricultural universities to promote modern farming techniques.

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222. Differentiate between a Rabi crop and Kharif crop.

Ans : COMP 2015

Aspect	Rabi Crop	Kharif Crop
Sowing season	Sown in winter (October to December)	Sown in monsoon (June to July)
Harvesting season	Harvested in spring (April to June)	Harvested in autumn (September to October)
Water requirement	Requires less water, grows in dry conditions	Requires more water, depend on monsoon rains
Examples	Wheat, barley, mustard	Rice, maize, cotton

223. Define the following terms :
(i) Broadcasting
(ii) Dribbling
(iii) Drilling

Ans : COMP 2004, 2013, 2011

(i) Broadcasting : It is a method of sowing seeds where they are scattered by hand or mechanically across the field without a specific pattern. This method is typically used for small seeds or in areas where uniform seed placement is not essential.

(ii) Dribbling : It is a method of sowing where seeds are dropped one by one or in small groups at regular intervals, either manually or using a special tool. This method ensures more accurate seed placement compared to broadcasting.

(iii) Drilling : Drilling is the most economical method of sowing seeds in straight lines at regular intervals. It involves using a bamboo shaft attached to a plough, which creates furrows for precise seed placement.

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224. With reference to the cultivation of tea in southern India :
(i) Name one important tea growing area.
(ii) Name the most important port for the export of tea.
(iii) Why are pulses so widely grown all over India? Give one reason why pulses are a good rotation crops for rice.
(iv) Define : Ratooning, Retting.

Ans : COMP 1998, 2000, 2004, 2005, 2013

(i) Kerala
(ii) Kolkata Port
(iii) Pulses are a major source of protein for people. They serve as excellent rotation crops because, as leguminous plants, they help restore soil fertility by fixing nitrogen.
(iv) (a) Ratooning : In sugarcane cultivation, ratooning involves cutting the cane close to the ground. After a period of time, the stem begins to regrow and produces a second crop, known as the ratoon.
(b) Retting : Retting is a process used in jute cultivation where bundles of jute stalks are submerged in soft, running water for 2 to 3 weeks to separate the fiber from the stems.

225. How is sugarcane propagated ?

Ans : MAIN 2010, 2015

Sugarcane is propagated by following two methods :
(a) Sett Method : In this methods, setts are taken from a healthy sugarcane plant and planted at equal intervals in furrows. Within about two weeks, the plant begins to grow, with new stalks emerging from the soil and leaves appearing shortly thereafter.
(b) Ratooning : In this method, the cane is cut close to the ground. After some time, the stem regrows, producing a second crop, known as the ratoon.

226. Differentiate between commercial agriculture and subsistence agriculture.

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234. With the reference to the rice cultivation, answer the following :
(i) Name the soil suitable for its growth.
(ii) Name the state that is the largest producer of this crop in India.
(iii) In which cropping season is it generally grown in India.

Ans : COMP 2022

(i) Alluvial soil is ideal for rice cultivation, as it retains water and is rich in nutrients.
(ii) West Bengal is the largest producer of rice in the country.
(iii) Rice is generally grown during the Kharif season (June to November) in India.

235. Answer the following :
(i) Name the months when the kharif crops are :
(a) sown
(b) harvested.
(ii) Give two geographical requirements for growing joar in India.
(iii) Name the state that leads in the cultivation of jowar.

Ans : SQP 1999

(i) Kharif crops:
(a) Sown: Kharif crops are typically sown in June-July with the onset of the monsoon.
(b) Harvested: Kharif crops are harvested in October-November.
(ii) Two geographical requirements for growing jowar in India :
(a) Climate : Jowar requires a warm and dry climate with temperatures between 26°C and 33°C.
(b) Soil : Jowar grows best in well-drained alluvial and loamy soils, though it can also thrive in red and black soils.
(iii) State leading in jowar cultivation : Maharashtra is the leading state in the cultivation of jowar in India.

236. Why is agriculture said to be the backbone of the Indian economy ?

Ans : MAIN 2000

1. Agricultural Dependency : A large portion of India's population relies on agriculture for their livelihood, with the rural economy still centered around agriculture and agro-based industries like cotton textiles, jute, sugar and tobacco.
2. Foreign Exchange : India earns significant foreign exchange by exporting agricultural products such as cotton, tea, cashew nuts, spices and oilseeds to industrialized nations.
3. Rural Stability : Agriculture provides a reliable source of income, helping to reduce the migration of the rural population to urban areas to some extent.

237. What are fibre crops ? Give two examples of plant fibre crops.

Ans : SQP 2004

Fibre crops are plants grown specifically for the extraction of their fibers, which are used to make textiles, ropes and other products.
Two examples of plant fibre crops are:
1. Cotton
2. Jute

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238. Describe briefly the processing of jute.

Ans : COMP 2006

The following are the three steps involved in preparing jute for export:
(i) The jute plants are harvested and left to dry for 2-3 days until the leaves fall off. The stalks are then bundled into 25 cm diameter bundles.
(ii) The retting process begins by submerging the bundles in soft, flowing water for 2-3 weeks. The process is complete when the fibers easily slip out when the stalk is pressed between the finger and thumb.
(iii) The stalks are beaten with a wooden mallet to loosen the fibers. The extracted fibers are washed, wrung and dried in the sun. They are then sorted by quality, pressed into 180 kg bales and made ready for export.

239. Give any of two effects of globalisation on Indian agriculture?

Ans : MAIN 2024

to know the expected returns for their produce. Additionally, government agencies like the Food Corporation of India (FCI) purchase agricultural products directly from farmers.

230. What are the geographical conditions necessary for the cultivation of groundnuts?

Ans : SQP 2008

Groundnut is a tropical leguminous plant cultivated during both the Kharif and Rabi seasons.

(i) Temperature : Groundnut thrives in regions with temperatures ranging from 22°C to 28°C.

(ii) Rainfall : Being drought-resistant, groundnut can grow in areas with low rainfall. It performs best in regions receiving 50-75 cm of well-distributed rainfall, particularly during the flowering stage.

(iii) Soil : Groundnut grows optimally in light sandy soils, as well as in red and black soils.

231. Give geographical reasons for the following :

(i) Jute has to be retted.

(ii) Cotton grows widely in Maharashtra.

(iii) Clonal planting is the best method for tea propagation.

(iv) Oilseeds are an important commercial crop grown in India.

Ans : SQP 2012, 2018

(i) Retting separates jute fibers from the woody core by soaking stems in water, enabling microorganisms to break down non-fibrous material for clean fiber extraction.

(ii) Black soil and a semi-arid climate with moderate rainfall and long sunny periods make Maharashtra ideal for cotton cultivation.

(iii) It ensures uniform growth, higher yields and preserves desirable traits like flavor and adaptability.

(iv) They provide edible oil, suit diverse climates and have by-products used as cattle feed and fertilizers.

232. Explain the following :

(i) The propagation of sugarcane by ratooning.

(ii) The propagation of paddy by transplantation.

Ans : MAIN 2012

(i) (a) After harvesting the first crop, the lower part of the cane and the roots are left in the field.

(b) The remaining stem begins to grow and produces a second crop called a ratoon, which is a successive crop obtained from the leftover roots and cane after the first harvest.

(ii) (a) Transplanting is the process of moving seedlings from the nursery to the main field.

(b) This process allows farmers to select only healthy and robust seedlings for cultivation, while rejecting weaker ones.

233. Explain the following terms and name the crop with which each is associated.

(i) Retting

(ii) Ratooning

(iii) Ginning

Ans : SQP 2017

(i) Retting : Retting is a microbiological process where jute bundles are soaked in clean, soft water for 2-3 weeks. This soaking helps loosen the outer bark, making it easier to extract the fibers from the stalk.

(ii) Ratooning : Ratooning is a method used in sugarcane cultivation where the cane is cut close to the ground, leaving the roots intact in the soil. This allows new shoots to grow from the remaining root stock, producing a second or successive crop known as a ratoon.

(iii) Ginning : Ginning is the process of separating cotton fibers from their seeds or raw material, preparing the fibers for further processing into textiles.

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2. Rainfall : Cotton thrives in regions with moderate rainfall of about 50 cm to 80 cm annually, but it requires a dry, sunny climate during the harvesting period to avoid damage to the crop.
3. Frost-Free Season : Cotton needs a frost-free period of about 200 frost-free days, as it is highly sensitive to frost.
4. Sunlight : Abundant sunlight is crucial for the healthy growth and maturation of cotton plants.

251. Explain the reason for the following stages in the processing of tea :
(i) Withering
(ii) Rolling
(iii) Fermentation
(iv) Firing
(v) Sorting

Ans : COMP 2015

(i) Withering : This process softens the tea leaves, making them flexible for further handling.
(ii) Rolling : Rolling helps to develop the characteristic flavor of the tea.
(iii) Fermentation : During fermentation, tannins are partially oxidized, changing the leaves' color to a coppery-red.
(iv) Firing : This process turns the tea leaves into their final black color.
(v) Sorting : The tea leaves are sorted by size using different meshes and given names such as Pekoe, Orange Pekoe and Dust.

252. Name the different stages of tea processing before it is sent out to the market.

Ans : MAIN 2013

Different Stages of Tea Processing :
1. Withering : Tea leaves are spread out on shelves called withering racks. Air is circulated over the leaves to reduce their moisture content, making them soft and flexible.
2. Rolling : The leaves are twisted to break their cells. This exposes the juices to the air, promoting fermentation and enhancing the tea's unique flavor.
3. Fermentation : Tannins in the tea leaves undergo chemical changes under controlled humidity and temperature. This process gives the tea leaves a reddish color and develops their characteristic taste.
4. Firing : The fermented leaves are dried by placing them on conveyor belts in an oven heated to 70°C to 75°C. This drying step imparts a rich black color to the tea and stops further fermentation.
5. Sifting : Special sifters or screens are used to sort the tea leaves. Leaves are separated based on size and quality, distinguishing between large, small, broken and unbroken leaves using different mesh sizes.
6. Tasting and Blending : Expert tea tasters evaluate the quality of the tea. They blend different batches to create specific brands and ensure consistent quality.
7. Grading : Tea is categorized based on its quality and brand. Each grade is assigned a specific name to differentiate it in the market.
8. Packing : The graded tea is packed into tinfoil and plywood chests. This packaging protects the tea from moisture, ensuring it remains dry and maintains its quality for export.

253. Mention four of the problems that jute industry faces two of which should be international problems.

Ans : COMP 2016

Following are the problems that jute industry faces:
1. Stiff competition from synthetic fibers : Jute faces competition from cheaper synthetic substitutes like plastic.
2. High production costs : Jute processing involves high costs, making it less competitive in the global market.
3. Decline in international demand : Global demand for jute has decreased due to the preference for synthetic alternatives.
4. Competition from Bangladesh : Bangladesh, being a major jute producer, affects India's share in the international jute market.

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1. Increased Export Opportunities : Globalization has opened up international markets for Indian agricultural products, leading to higher exports of commodities like tea, spices and cotton, thus boosting the income of farmers.
2. Introduction of Advanced Technologies: Globalization has facilitated the introduction of modern agricultural technologies and practices, such as high-yield seeds and improved irrigation methods, enhancing productivity and efficiency in Indian agriculture.

240. State three advantages of Cooperative farming.

Ans : SQP 2010

(i) Cooperative farming allows small farmers to combine their resources, purchase inputs at bulk rates and increase production volumes, enabling access to new markets.
(ii) It helps farmers negotiate better prices, spread risks and share knowledge, skills and labor efficiently.
(iii) It enhances the quality of life for member-farmers by allowing them to manage time off, care for children and receive additional help when needed.

241. What was the impact of Green Revolution on Indian agriculture ?

Ans : COMP 2011

The Green Revolution had the following impact on Indian agriculture:
(i) It transformed Indian agriculture from subsistence farming to a more commercial and market-driven approach.
(ii) It promoted the development of an intensive agricultural system that boosted production, leading to self-sufficiency in food grains.
(iii) The adoption of new technologies during the Green Revolution generated more employment opportunities in the agricultural sector.
(iv) It allowed farmers to achieve higher returns from agriculture through increased use of agricultural inputs.

242. With reference to jute, answer the following questions :
(i) State the soil conditions that favour the growth of jute.
(ii) Why are floods beneficial for the growth of jute ?
(iii) What are climate requirements for growing jute.

Ans : COMP 2001

(i) The alluvial soil deposited by the Brahmaputra River supports the growth of jute.
(ii) Although jute plants deplete soil fertility, floods bring fresh alluvial deposits each year, replenishing the soil and benefiting jute cultivation.
(iii) The three key climatic conditions favoring jute cultivation are:
  (a) Soil: Jute thrives in sandy and clayey loams and grows well in the alluvial soils of river plains and deltas, where floods annually renew the soil.
  (b) Temperature: Jute flourishes at high temperatures around 34°C with relative humidity of 80% to 90%, but it can also grow in areas with a minimum temperature of 27°C.
  (c) Rainfall: Jute requires heavy rainfall between 170 cm and 200 cm during its growth period, as it cannot withstand continuous drought.

243. Give a geographical reason for each of the following :
(i) Plantations are managed by large multinational companies.
(ii) Fields are rotated instead of crops in shifting cultivation.
(iii) In Extensive agriculture, yield per hectare is low but total yield is large.

Ans : SQP 2004

(i) Plantations require large-scale investments in infrastructure, machinery and labor, which are typically beyond the capacity of small farmers. Multinational companies have the resources and

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Ans : SQP 2007

Aspect	Commercial Agriculture	Subsistence Agriculture
Purpose	Grown for sale and profit, often for large markets.	Grown primarily for family consumption and local needs.
Scale of Operation	Conducted on large farms with modern equipment.	Conducted on small plots with traditional tools.
Use of Technology	High use of modern technology, machinery and fertilizers.	Minimal use of modern technology, relies on manual labor
Crop Variety	Focuses on cash crops like cotton, sugarcane and tea.	Focuses on food crops like rice, wheat and maize.

227. State an important difference between the climatic requirements for growing cotton and jute.

Ans : MAIN 2022

Aspect	Cotton	Jute
Climate	Warm and dry climate	Hot and humid climate
Rainfall	Moderate rainfall (50 to 80 cm)	Heavy rainfall (170 to 200 cm)
Temperature	21°C to 27°C	27°C to 34°C

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228. Compare the geographical requirements of wheat and rice.

Ans : SQP 2011

Rice	Wheat
An average temperature of 25°C is ideal for the crop. In the early growing stages, a temperature range of 16°C to 20°C is preferred, while during the ripening stage, temperatures between 18°C and 32°C are most suitable.	It requires varying climates for sowing and harvesting. During the early stages, a temperature range of 10°C to 15°C is needed, while during the ripening stage, temperatures between 25°C to 28°C are ideal.
It requires rainfall ranging between *150 cm to 300 cm.	Rainfall of 50 cm-75 cm is sufficient.
It requires loamy and alluvial soil.	Loamy, domat and black soils are preferred, with the soil needing to be well-drained, have a good texture and contain humus along with a small amount of lime.

229. How is the government helping Indian farmers in increasing their agriculture production ? Explain any four points.

Ans : COMP 2000, 2019

1. Launching of Irrigation Schemes : The government has developed numerous multipurpose projects to provide both power and irrigation facilities to farmers.
2. HYV Seeds and Agricultural Universities : To boost production, the government distributes High-Yielding Variety (HYV) seeds to farmers, conducts specialized seminars and has established many new agricultural universities.
3. Public Procurement System and Agriculture Price Commission : The Agriculture Price Commission has been established to set advance prices for agricultural products, enabling farmers

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248. Give a few important characteristics of Indian agriculture.

Ans : MAIN 2019

Important Characteristics of Indian Agriculture:

1. Monsoon Dependency : Indian agriculture has traditionally relied on the monsoon rains, which are highly unpredictable. Only about one-third of the cultivated land benefits from extensive irrigation systems.
2. Diverse Geography and Climate : India's vast and varied topography, along with its range of soil types and climatic conditions, supports the cultivation of a wide array of crops.
3. Focus on Food Crops : A key feature of Indian agriculture is the predominance of food crops over other types, driven by the necessity to feed a large and growing population.
4. Three Major Crop Seasons : India experiences three primary cropping seasons, each influenced by seasonal changes:
   (a) Kharif Season : Crops grown during this season include rice, maize, bajra and cotton. These are typically sown with the onset of the monsoon rains.
   (b) Rabi Season : This season includes crops such as wheat, barley, jowar, gram and tobacco. These are usually planted in the winter months.
   (c) Zaid Season : During the short summer period between the Rabi and Kharif seasons, crops like maize, rice, groundnut, fruits and vegetables are cultivated.

249. In the context of the Indian Agricultural answer the following :

(i) Mention two features, which reflect a shift from subsistence farming to commercial farming.

(ii) Give the reasons why the yield of Indian Agriculture is low as compared to world standards ?

(iii) State the characteristics of plantation agriculture ?

(iv) How has the consolidation of land holdings helped the farming community ?

Ans : COMP 2016

(i) Two features, which reflect a shift from subsistence farming to commercial farming are :
   (a) Increased use of high-yield variety (HYV) seeds and modern machinery, leading to higher production aimed at market sale
   (b) Specialization in cash crops like cotton, sugarcane and tea, which are grown for profit and export rather than for family consumption.

(ii) (a) Use of poor quality seeds and dependence on monsoons, along with the practice of primitive farming methods.
   (b) Poverty and illiteracy among farmers, limited use of manures, small landholdings and deforestation leading to soil erosion.

(iii) Characteristics of plantation agriculture :
   (a) Plantation agriculture involves the cultivation of a single crop over large areas.
   (b) Crops typically take 2 to 4 years to yield and require significant capital investment.
   (c) This type of farming depends on cheap and skilled labor and follows scientific methods of cultivation.

(iv) Consolidation of landholdings has benefited the farming community by preventing land fragmentation, improving access to irrigation, enabling greater use of machinery, allowing crop rotation, ensuring a steady income and promoting the use of scientific farming methods.

250. What are the climatic conditions that favour the cultivation of cotton ?

Ans : SQP 2013

1. Temperature : Cotton requires a warm climate, with temperatures ranging between 21°C to 27°C during its growing period.

Ans : MAIN 2009

1. Alluvial Soil : Jute grows well in fertile, well-drained alluvial soils.
2. Moisture Retention : The soil should retain moisture, as jute requires consistent moisture.
3. pH : Jute prefers slightly acidic to neutral soil with a pH of 6.4 to 7.2.

217. In what way is Ganga-Brahmaputra Delta suitable for jute cultivation ?

Ans : SQP 2015

Since jute depletes soil fertility, the Ganga-Brahmaputra Delta holds a virtual monopoly in jute cultivation because the soil in this region is enriched annually by the alluvial deposits brought by seasonal floods.

218. What is meant by "transplantation"? State two of its advantages.

Ans : SQP 2007

Transplantation is the process of growing seedlings in a nursery and then transferring them to the main field.

Two advantages of transplantation :

1. It produces stronger, healthier plants.
2. It ensures better spacing for improved growth and yield.

THREE MARKS QUESTIONS

219. Give one reason to explain each of the following:

(i) West Bengal is a leading producer of jute.

(ii) Millets are fast becoming the popular food crops.

(iii) More than two ratoon crops are not advisable for sugarcane farmers.

Ans : MAIN 2024

(i) West Bengal produces a large amount of jute due to its hot and humid climate, along with fertile alluvial soil, which is ideal for jute cultivation.

(ii) Millets are gaining popularity because they are highly nutritious, drought-resistant and require fewer resources, making them a sustainable choice for farming.

(iii) More than two ratoon crops are not advisable for sugarcane farmers because repeated ratooning depletes soil nutrients, leading to a decline in crop quality and yield.

220. (i) Name the most important fibre crop in West Bengal.

(ii) Describe two geographical conditions which favour the growth of this crop.

Ans : SQP 2005

(i) The most important fiber crop in West Bengal is jute.

(ii) Two geographical conditions which favour the growth of this crop :

(a) Rainfall : Jute requires heavy rainfall of about 170 cm to 200 cm, evenly distributed throughout the growing period. Prolonged drought can severely damage the crop.

(b) Temperature : Jute thrives in a hot and humid climate, with temperatures ranging from 24°C to 35°C and high relative humidity.

221. Give one reason for each of the following :

(i) Tea is grown mainly on hill and mountain soil.

(ii) The groundnut crop is often used as a rotation crop with bajra, jowar and gram.

(iii) Ratoon cropping is popular in sugarcane.

Ans : COMP 2007, 2012, 2015, 2018

(i) Because tea roots cannot tolerate stagnant water, growing on hill slopes ensures proper drainage.

(ii) Groundnut roots contain rhizobium bacteria, which convert atmospheric nitrogen into nitrogenous compounds, enriching the soil for the next crop.

(iii) Ratoons mature faster and the cultivation cost is significantly lower since replanting is not required.

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254. State two geographical conditions suitable for the cultivation of rice ?

Ans : MAIN 2009

Condition essential for cultivation of rice :

(i) Soil : Rice thrives in alluvial soil with an impervious clay subsoil that prevents water drainage. It also grows well in heavy loam, but sandy soils are unsuitable. Terraced hill slopes can also support rice cultivation.

(ii) Climate : Rice needs abundant water, growing best in areas with 150 to 300 cm of rainfall or where irrigation is available. Fields must be flooded during the initial weeks. It also requires warm temperatures, ranging from 16°C to 20°C in the early stages and 18°C to 32°C during ripening.

255. Give a geographical reason for each of the following :

(i) Wheat cultivation is confined to the northern parts of the country.

(ii) Punjab is the leading producer of wheat in India.

(iii) Government of India is encouraging cultivation of pulses.

Ans : MAIN 2010

(i) Wheat grows best in a cool climate with moderate rainfall. It requires temperatures between 10°C and 15°C during its growing phase and 25°C to 28°C at ripening. Moderate rainfall of 50 cm to 100 cm is ideal during the growing season, with a slight rainfall before ripening enhancing its quality.

(ii) Punjab is the leading producer of wheat in India due to its favorable climate, fertile alluvial soil and well-developed irrigation facilities, which provide optimal conditions for wheat cultivation.

(iii) Pulses are an essential part of the Indian diet, especially for those consuming a starchy vegetarian diet, as they provide vegetable protein. As leguminous crops, pulses help fix atmospheric nitrogen, thereby enriching soil fertility naturally.

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256. Give a geographical reason for each of the following:

(i) Coffee is grown on the slopes of the hills in Peninsular India.

(ii) Coffee estates have coffee inter-planted with orange trees, cardamom and pepper vines.

(iii) Tea bushes are pruned at regular intervals.

Ans : SQP 2006

(i) Because the slopes provide good drainage, preventing waterlogging and the climate at higher altitudes is cooler, which is ideal for coffee cultivation.

(ii) Coffee estates have coffee inter-planted with orange trees, cardamom and pepper vines because these plants provide shade for the coffee plants and increase overall land productivity, creating a more efficient and diversified farming system.

(iii) Tea bushes are pruned at regular intervals to encourage the growth of fresh, tender leaves, which are the most suitable for producing high-quality tea.

257. What is Ratooning ? State two advantages of Ratooning.

Ans : COMP 2006

Ratoon cropping is a method used in sugarcane farming where the mature cane is cut close to the ground, allowing the plant to regrow and produce a second crop, known as ratoon.

Advantages of Ratoon Cropping :

(i) The cost of field preparation and planting is eliminated, significantly reducing the overall cultivation expenses.

(ii) Ratoon crops mature faster.

258. State any three problems faced by sugarcane cultivators.

Ans :

Problems faced by sugarcane cultivators in India include:

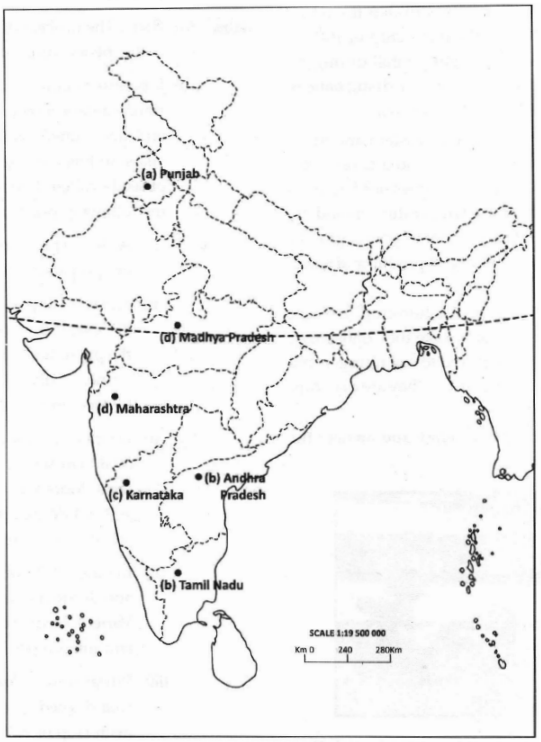
(i) Sugarcane depletes soil nutrients and requires large amounts of manure and water for healthy growth.

(ii) The distance between mills and growing

MAP BASED QUESTION

269. On the outline map of India, shade and mark:
(a) The highest wheat producing state in India.
(b) Any two rice producing states in South India.
(c) One ragi producing region.
(d) Two major areas for cultivation of pulses.

Ans : COMP 2019



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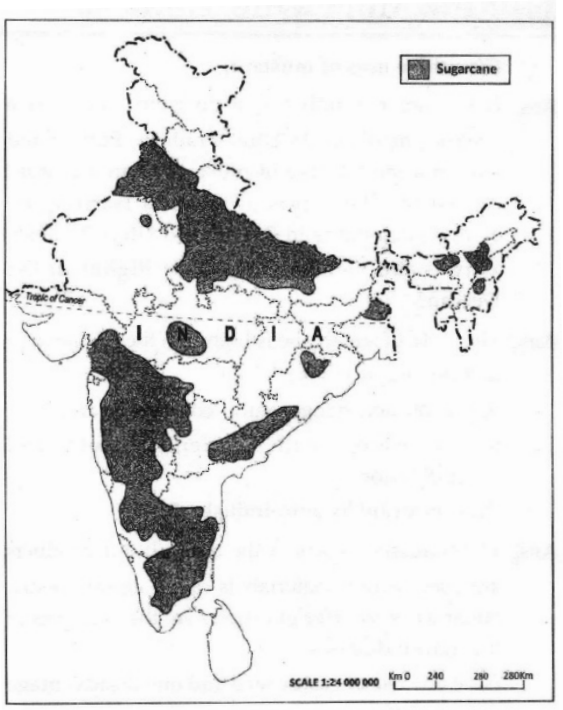
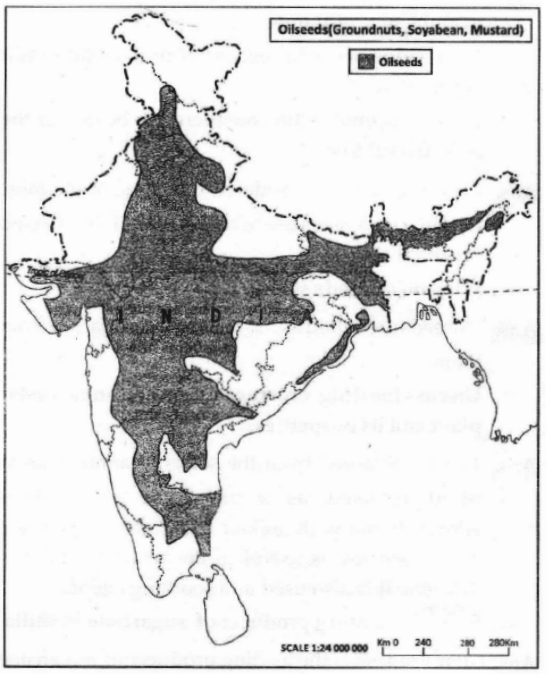
270. On an outline map of India, shade and mark the areas where the following are cultivated :
(i) Sugarcane ;
(ii) Groundnut;
(iii) Mustard
(iv) Soyabean.

Ans : MAIN 2013

(i)



(ii,iii,iv)



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5. Spinning : The sliver is fed into spindles and spun to produce cotton yarn, ready for textile manufacturing.

262. With reference to groundnuts, answer the following questions :
(a) Which two states in India are the leading producers of groundnut ?
(b) What conditions of temperature and rainfall favour the growth of groundnut?
(c) Mention the main uses of groundnut.

Ans : SQP 2011

(a) Groundnut oil is commonly used for cooking and its oil-cake serves as cattle feed. The nuts are consumed roasted, salted, or sweetened. Gujarat and Andhra Pradesh are the top groundnut-producing states in India.
(b) Conditions of temperature and rainfall favour the growth of groundnut are :
(i) Temperature: Groundnuts thrive in temperatures between 20°C and 25°C. Dry weather is essential during the ripening stage.
(ii) Rainfall: Groundnuts require light to moderate rainfall, typically between 50 to 100 cm, with well-distributed rainfall throughout the season.
(c) The primary uses of groundnut are :
(i) Groundnut oil is widely used as an edible cooking oil.
(ii) Groundnuts are also grown as a rotational crop to improve soil fertility.

263. State the remedial action taken by the government to overcome the problems of sugarcane farmers.

Ans : SQP 2015

1. Establishment of Fertilizer Plants : The government has established numerous fertilizer manufacturing facilities to supply farmers with the necessary nutrients for their crops.
2. Land Consolidation Initiatives : Measures have been implemented by the government to merge smaller agricultural plots into larger, more efficient landholdings.
3. Development of Irrigation Infrastructure : To ensure consistent irrigation, the government has constructed large water reservoirs and extensive canal systems.
4. Formation of Cooperative Societies : Cooperative societies have been set up to address and resolve the various challenges faced by farmers, providing them with necessary support and resources.

264. State the economic importance of oilseeds.

Ans : MAIN 2016

The economic significance of oilseeds is as follows:
(i) Oilseeds hold great importance in Indian agriculture, ranking just below cereals in terms of value and contribution to the economy.
(ii) Vegetable oil is a key dietary component, with over 80% of the oil produced being consumed as food.
(iii) Vegetable oils, such as linseed oil, have industrial uses in products like paints, varnishes and lubricants.
(iv) The oil industry, from small to large scale, provides substantial employment opportunities.
(v) Oil cake, a by-product of oil extraction, serves as cattle feed and is also used as fertilizer for crops like cotton, tea and tobacco.

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CASE BASED QUESTION

265. Study the picture given above and answer the following questions :
(i) Name the crop which is being planted. Give one benefit of this method of planting this crop.
(ii) Mention the climatic conditions which favour the cultivation of the crop being planted.
(iii) Why does the cultivation of rice require a lot of manual labour ?

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Ans : COMP 2010, 2018

(i) Rice: This method allows for the selection of only the healthiest and strongest seedlings for crop cultivation.

(ii) Favorable conditions:
  (a) Temperature : Around 24°C.
  (b) Rainfall : Between 150 cm to 300 cm.
  (c) Soil : Alluvial soil.

(iii) Both transplanting and harvesting involve manual labor, requiring hands-on processes.

266. Study the picture given below and answer the questions that follow :

(i) Name one State where this crop grows well.

(ii) Why are mostly women employed to harvest it ?

Ans : COMP 2016

(i) Assam

(ii) Tea plucking is a skilful task that demands both patience and judgment. It is typically performed by women, who are considered to be more adept at the delicate process of picking.

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267. (a) Mention two steps taken by the government to boost agricultural production in India.

(b) (i) Name two varieties of millet grown in India.

(ii) What is the soil requirement for growing millet ?

(c) Study the picture given below and answer the questions that follow :

(i) Mention the climatic condition that is suitable for the cultivation of this crop.

(ii) Name the state that produces the largest amount of this crop.

(iii) In which cropping season is this crop grown in India ?

(d) Give a geographical reason for each of the following :

(i) Cultivation of wheat is confined to the northern part of India.

(ii) Practicing mixed farming gives security to farmers.

(iii) Ratoon cropping is gaining popularity among sugarcane cultivators.

Ans : SQP 2019,2022

(a) (i) Irrigation schemes launched: Several multipurpose projects have been constructed to provide both power and irrigation facilities for farmers.

(ii) HYV seeds and Agricultural Universities: To boost production, the government is distributing High-Yielding Variety (HYV) seeds to farmers. Special seminars are being organized and numerous new Agricultural Universities have been established.

(b) (i) Examples of crops: Jowar, Bajra.
(ii) Soil type: Red and sandy soil.
(c) (i) The ideal conditions for cultivation of crop include a temperature range of 21°C to 27°C and well-distributed rainfall between 50 cm and 80 cm.
(ii) Leading state : Gujarat.
(iii) The harvesting seasons vary by region: In Punjab and Haryana, harvesting takes place between April and May, while in Tamil Nadu, crops are grown during both the Kharif and Rabi seasons.
(d) (i) Reason for cultivation in winter: It is a temperate crop, grown in the northern regions of India where winter temperatures do not exceed 10°C to 15°C.
(ii) Mixed farming: In this method, crops are cultivated alongside livestock rearing.
(iii) Ratoon cropping: Ratoon crops mature earlier and the production cost is significantly lower.

268. Study the picture given below and answer the following questions :

(a) Name the other method of planting the crop. In which area is this method practised?
(b) Give a geographical reason for each of the following :
(i) Rice is not the main crop in the Deccan Plateau.
(ii) Punjab is the largest producer of rice despite deficient rainfall.
(iii) Wheat grows well in loamy soil.
(c) Mention the climatic conditions which favour the cultivation of the crop being planted.

Ans : SQP 2018

(a) The Japanese method, introduced in 1953, is an improved form of transplantation that has gained popularity in recent years. This method uses high-yielding seed varieties called 'Japonica' and follows these practices:
(i) Seedlings are prepared in nurseries, similar to traditional methods.
(ii) The plants are spaced with rows 25 cm apart and 15 cm between each plant, making it easier for farmers to weed and care for the crops.
(b) (i) The Deccan Plateau receives only 50-80 cm of rainfall, which is insufficient for rice cultivation. Additionally, while rice requires clayey loam soil, the plateau is rich in black soil, more suitable for cotton cultivation.
(ii) In Punjab, 97% of rice fields are irrigated and the high input of HYV seeds, fertilizers, mechanization and finance leads to the highest per-hectare yield.
(iii) Wheat thrives in loamy soil because it needs well-drained, aerated loam, making it the primary crop of Northwestern India on the loamy plains.
(c) (i) Rice requires an average temperature of 25°C. During the early stages, temperatures between 16°C and 20°C are ideal, while during the ripening stage, temperatures between 18°C and 32°C are necessary.
(ii) It requires rainfall between 150 cm and 300 cm.
(iii) It grows best in loamy and alluvial soils.

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examples of mineral-based industries in India include:

2.1 Iron and Steel Industry

The iron and steel industry is the backbone of industrial development in any country. In India, this sector is a cornerstone of industrialization, providing raw materials for various industries, including construction, manufacturing, transportation and defense. India is one of the largest producers of steel in the world and the industry plays a key role in meeting domestic demand as well as exporting to international markets. Major steel plants in India include TISCO (Tata Iron and Steel Company), Bhilai Steel Plant, Rourkela Steel Plant and Visakhapatnam Steel Plant.

1. TISCO (Tata Iron and Steel Company)

Located in Jamshedpur, Jharkhand, TISCO is one of the oldest and most prominent steel plants in India. Established by the Tata Group in 1907, it is recognized as a pioneer in the Indian steel industry. TISCO has played a crucial role in the growth of India's private sector and is renowned for its high-quality steel products. The plant has undergone continuous modernization to stay competitive globally and has a strong presence in both domestic and international markets. TISCO is not only known for its steel production but also for its emphasis on corporate social responsibility and community development in the region.

2. Bhilai Steel Plant

Located in Bhilai, Chhattisgarh, this public sector steel plant is managed by the Steel Authority of India Limited (SAIL). Established in 1959 with assistance from the Soviet Union, it is one of India's leading producers of steel plates and structural steel. Bhilai Steel Plant is especially noted for its production of rails, which are essential for India's extensive railway network. The plant has contributed significantly to the development of India's infrastructure, supplying steel for bridges, buildings and large-scale projects. It also plays a vital role in the economic development of Chhattisgarh, providing employment to thousands and promoting regional growth.

3. Rourkela Steel Plant

Situated in Rourkela, Odisha, this plant is another key unit under SAIL. Established in 1959 with technological support from Germany, Rourkela Steel Plant was the first public sector steel plant in India. It produces a wide range of steel products, including hot and cold-rolled steel, sheets and special alloy steel. The plant is equipped with advanced technology and is known for its innovation in steel production. Its strategic location in Odisha allows easy access to raw materials, such as iron ore and coal. Rourkela Steel Plant has been instrumental in the industrial development of Odisha and is a major contributor to India's steel exports.

4. Visakhapatnam Steel Plant

Located in Visakhapatnam, Andhra Pradesh, this steel plant is often referred to as "Vizag Steel" and is managed by Rashtriya Ispat Nigam Limited (RINL). Established in 1971, it is one of the most modern and technologically advanced steel plants in India. Visakhapatnam Steel Plant is known for producing high-quality steel and catering to both domestic and international markets. The plant's strategic location near the coast provides it with easy access to export markets and raw materials. Vizag Steel has played a significant role in the industrialization of Andhra Pradesh and has created a large number of direct and indirect employment opportunities in the region.

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2.2 Petrochemical Industry

The petrochemical industry is a fast-growing sector in India, processing petroleum and natural gas into chemicals that are used in the production of everyday products like plastics, synthetic fibers, rubber and fertilizers. The importance of this industry lies in its versatility, as petrochemicals are used in various sectors, including agriculture,

CHAPTER 11

MANUFACTURING INDUSTRIES

SUMMARY

Industries are the backbone of a nation's economy, playing a crucial role in its overall development. They not only provide employment opportunities but also enhance the country's infrastructure, stimulate technological advancements and improve the standard of living. In India, industries contribute significantly to the GDP and offer livelihood to millions of people. The Indian industrial sector can be broadly classified into two categories based on the source of raw materials: Agro-based industries and Mineral-based industries. Both categories are critical in shaping the nation's economic landscape, fostering both rural and urban development.

1. AGRO-BASED INDUSTRIES

Agro-based industries rely on agricultural products as their primary raw materials. These industries are vital for rural development, as they provide employment opportunities in regions where agriculture is the primary source of income. Agro-based industries ensure the effective utilization of agricultural produce, thereby supporting farmers and contributing to national economic growth. Some key examples of agro-based industries in India are:

1.1 Sugar Industry

The sugar industry is one of the oldest and most important agro-based industries in India. It plays a significant role in supporting rural economies, as sugarcane is the primary raw material. The industry provides employment to millions of farmers and factory workers, particularly in states like Uttar Pradesh, Maharashtra and Tamil Nadu. India is one of the largest producers of sugar in the world and this industry plays a pivotal role in generating revenue for both the government and farmers. Additionally, by-products like molasses and bagasse are utilized in the production of ethanol, alcohol and paper, further contributing to industrial growth.

1.2 Textile Industry (Cotton and Silk)

The textile industry, especially cotton and silk production, is one of the largest agro-based industries in India. The cotton textile industry is the largest organized modern industry in the country and supports a vast network of cotton farmers. India is one of the world's largest producers and exporters of cotton textiles, ranking third after the USA and the UK. The silk industry, on the other hand, has a significant cultural and economic impact. India is renowned for its high-quality silk and ranks as one of the largest producers of raw silk globally. The silk industry, concentrated in states like Karnataka and Tamil Nadu, generates significant export earnings and provides employment, especially to women in rural areas.

2. MINERAL-BASED INDUSTRIES

Mineral-based industries rely on minerals, ores and metals as their raw materials. These industries are foundational for the growth of infrastructure, manufacturing and technological sectors. They are capital-intensive, but their contribution to national development is immense as they provide raw materials for other industries and play a critical role in the export economy. Key

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areas, along with issues related to irrigation and transportation, pose significant challenges.

(iii) The government-fixed prices are often not profitable for farmers.

259. Describe briefly the Dry Parchment method of processing of coffee.

Ans :

The Dry Parchment method of processing coffee involves several steps:

1. Harvesting : Ripe coffee cherries are handpicked from the plants.
2. Drying : The cherries are then spread out in the sun to dry for several days. During this time, the outer fruit layer shrinks and hardens, forming a dry husk.
3. Hulling: Once the cherries are fully dried, they are processed through a machine to remove the outer husk and extract the coffee beans inside.
4. Sorting and Grading: The beans are then sorted and graded based on size, weight and quality before being packed for sale or further processing.

260. What are the problems associated with the growing of cotton?

Ans :

Problems Facing Cotton Cultivation in India:

(i) Rising Input Costs and Financial Strain : The escalating costs of seeds, fertilizers and labor have become a major issue. The Minimum Support Price (MSP) for cotton is significantly lower than what is needed to cover these high input expenses. Additionally, genetically modified (GM) companies charge premium prices for cotton seeds and fertilizers. These factors have led many farmers to accumulate unmanageable debts, resulting in numerous suicides.

(ii) Declining Yields and Soil Degradation : There is a noticeable decline in both the quantity and quality of cotton yields. Continuous use of pesticides has led to the deterioration of soil fertility, while pests are increasingly developing resistance to chemical treatments. This combination adversely affects crop productivity and sustainability.

(iii) Water Resource Management Issues : Effective management of water resources is lacking and groundwater levels are depleting. Over 35% of cotton cultivation areas depend on rain-fed agriculture with poor irrigation facilities, making production highly vulnerable to fluctuations in the monsoon season.

(iv) Lack of Modern Technology and Quality Control : The absence of advanced technology in both cultivation and ginning processes has negatively impacted yields and resulted in contamination. Cotton is prone to quality degradation during harvesting, marketing and ginning if proper care is not taken. Additionally, the genetic purity of cotton varieties and hybrid seeds is deteriorating, leading to inconsistencies in fiber composition. This makes it challenging for export firms that prioritize consistent quality. Moreover, there is increasing competition from synthetic fibers, which are cheaper to produce and offer greater consistency.

261. Describe the process or stages in Ginning of Cotton.

Ans : COMP 2002

1. Ginning : Once cotton is harvested, either manually or using machines, it undergoes the ginning process. Ginning involves separating the cotton fibers (lint) from the seeds and removing the short fibers (linters) that stick to them.
2. Seed Processing : The separated cotton seeds are often crushed to extract cottonseed oil. The leftover seed residue is then used as cattle fodder.
3. Baling : The cotton lint is compressed into bales, making it easier to transport to manufacturing areas.
4. Washing and Combing : The fibers are thoroughly washed and combed to create a continuous, rope-like bundle known as sliver.

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manufacturing, healthcare and construction. The growth of the petrochemical industry is crucial for reducing dependency on imports and ensuring self-sufficiency in vital raw materials for many other industries.

2.3 Electronics Industry

The electronics industry is a rapidly expanding sector that is essential for the technological advancement of the country. This industry produces a wide range of products, from consumer electronics like mobile phones, televisions and computers, to industrial electronics and components for sophisticated machines and systems. The mineral-based nature of this industry means it heavily relies on materials like copper, silicon and rare earth metals. The growth of the electronics industry is vital for India's ambition to become a global manufacturing hub, especially with the rise of initiatives like "Make in India." It is also a key driver of innovation, research and development in the country.

3. SIGNIFICANCE OF AGRO-BASED AND MINERAL-BASED INDUSTRIES

Both agro-based and mineral-based industries are crucial for the economic and social progress of India. They create millions of jobs, generate revenue and contribute to the development of infrastructure. Agro-based industries, in particular, are vital for rural development, providing a steady source of income for farmers and helping to reduce poverty in agricultural regions. The development of these industries ensures that agricultural produce is used efficiently, minimizing waste and maximizing output.

Mineral-based industries, on the other hand, are essential for the country's industrial growth and infrastructure development. They provide the raw materials needed for constructing buildings, roads, bridges and vehicles, which are necessary for economic growth. Additionally, these industries play a significant role in international trade, as India is a major exporter of minerals and metals.

MULTIPLE CHOICE QUESTION

1. Which of the following is NOT a centre for the iron and steel industry?
(a) Bhilai
(b) Bengaluru
(c) Rourkela
(d) Vishakhapatnam

Ans : MAIN 2024

Thus (b) is correct option.

2. Which of the following is a basic/key industry?
(a) Iron and Steel Industry
(b) Silk Industry
(c) Electronic Industry
(d) Cotton textile Industry

Ans : MAIN 2023

Thus (a) is correct option.

3. India is one of the top_____industrialised countries.
(a) five
(b) seven
(c) eight
(d) ten

Ans : COMP 2011

Thus (c) is correct option.

4. The products of agro-based industries mostly consist of_____.
(a) consumer goods
(b) medicinal goods
(c) beverages
(d) consumetics

Ans : MAIN 2015

Thus (a) is correct option.

5. _____industries are also known as household industries.
(a) Basic
(b) Cottage
(c) Cooperative
(d) Village

Ans : COMP 2016

Thus (d) is correct option.

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6. Iron and steel industry which provide public utility based services.
(a) Tertiary
(b) Ancillary
(c) Basic
(d) Secondary

Ans : COMP 2001

Thus (c) is correct option.

7. _____are the industries which provide public utility based services.
(a) Basic Industries
(b) Cooperative Industries
(c) Ancillary Industries
(d) Tertiary Industries

Ans : MAIN 2015

Thus (d) is correct option.

8. Railways, Banking, Post and Telegraph industries are _____ industries.
(a) Tertiary
(b) Secondary
(c) Ancillary
(d) Basic

Ans : MAIN 2010

Thus (a) is correct option.

9. _____is used for producing steam which is used as a source of power for sugar industry.
(a) Molasses
(b) Bagasse
(c) Press mud
(d) Khandsari

Ans : SQP 2000

Thus (b) is correct option.

10. _____are used for the distillation of liquor and to produce some chemicals and synthetic rubber.
(a) Press mud
(b) Bagasse
(c) Khandsari
(d) Molasses

Ans :

Thus (d) is correct option.

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11. Which of the following is a by-product of sugar industry used for making cardboard, paper and insulation boards?
(a) Press mud
(b) Molasses
(c) Bagasse
(d) All of the above

Ans : SQP 2003

Thus (c) is correct option.

12. Name the by-product of sugar industry used for making wax, carbon paper and shoe polish.
(a) Press mud
(b) Molasses
(c) Bagasse
(d) Khandasari

Ans : COMP 2014

Thus (a) is correct option.

13. Which of the following cities account for nearly half of India's cotton mill cloth manufactured?
(a) Jaipur and Kanpur
(b) Ahmedabad and Mumbai
(c) Coimbatore and Chennai
(d) Panipat and Kolkata

Ans : MAIN 2006

Thus (b) is correct option.

14. The rearing of silkworm for silk production is called_____.
(a) Monoculture
(b) Pisciculture
(c) Sericulture
(d) Apiculture

Ans : SQP 2007

Thus (c) is correct option.

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15. _____ industry forms the backbone industrial development in any country.
(a) Chemical
(b) Iron and steel
(c) Coal
(d) Electronics

Ans : COMP 2018

Thus (b) is correct option.

16. _____is used for hardening of steel.
(a) Manganese
(b) Copper
(c) Nickel
(d) Chromium

Ans : MAIN 2017

Thus (a) is correct option.

17. Iron is galvanised by using chromium, _____and tungsten.
(a) copper
(b) silica
(c) cabon
(d) nickel

Ans : SQP 2009

Thus (d) is correct option.

18. The molten iron that is obtained by the process of ore reduction is known as_____.
(a) Cast iron
(b) Wrought iron
(c) Pig iron
(d) Steel

Ans : SQP 2008

Thus (c) is correct option.

19. _____is the largest steel making company in India in the Public sector.
(a) Steel Production Unit of India.
(b) Steel Manufacturing Unit of India.
(c) Steel Company of India.
(d) Steel Authority of India.

Ans : COMP 2007

Thus (d) is correct option.

20. Which of the following are the integrated Iron and Steel plants where SAIL produces Iron?
(a) Bhilai and Durgapur
(b) Salem and Bhadravati
(c) Visakhapatnam and Vijayanagar
(d) None of the above

Ans : MAIN 2013

Thus (a) is correct option.

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21. _____is the oldest steel plant in the country.
(a) TISCO
(b) CISCO
(c) DELCO
(d) TELCO

Ans : MAIN 2009

Thus (a) is correct option.

22. Bhilai Steel plant was established in collaboration with _____ in _____.
(a) Germany; West Bengal
(b) erstwhile USSR; Chhattisgarh
(c) France; Madhya Pradesh
(d) Japan; Odisha

Ans : SQP 2004

Thus (d) is correct option.

23. Bhilai Steel Plant is located in Durg district of_____.
(a) West Bengal
(b) Madhya Pradesh
(c) Chhattisgarh
(d) Odisha

Ans : COMP 2006,2007,2013

Thus (c) is correct option.

24. The main source of power for the Bhilai Steel Plant comes from the power station at_____.
(a) Korba
(b) Balaghat
(c) Durg
(d) Bokaro

Ans : MAIN 2000

Thus (a) is correct option.

25. The Rourkela Steel Plant was built with cooperation from_____in_____.
(a) Britain; Bhirmitrapur
(b) France; Baradwar
(c) Russia; Keonjhar
(d) Germany; Sundargarh

Ans : SQP 2001

Thus (d) is correct option.

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Basic Industry: This industry forms the foundation for other industries. For example, the iron and steel industry supplies machinery, tools and automobile parts essential for the growth of various other industries.
Secondary Industry: This industry produces consumer goods and covers a wide range of products, from everyday items to industrial-use goods.

100. Classify industries on the basis of the nature of products. Give one example of each.

Ans : COMP 2008

On the basis of nature of products, industries can be classified as:
(i) Heavy Industries : Heavy industries are those that manufacture capital goods and durable consumer products, which are generally large and bulky. These industries are essential for producing the machinery and infrastructure needed for other sectors. Example: Machine tool industry.
(ii) Light Industries : Light industries focus on producing goods that are lightweight and less bulky, making them easier to handle and transport. These industries typically manufacture consumer goods that are used directly by individuals. Examples: Bicycles, sewing machines and electronic goods.

101. Give two points of difference between a public sector and private sector industry.

Ans : MAIN 2023

Public Sector Industry	**Private Sector Industry**
Owned and operated by the government.	Owned and operated by private individuals or companies.
Aims at public welfare and national development.	Primarily focused on profit generation and business growth.

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102. Mention two advantages of setting up a small scale industry.

Ans : MAIN 2020

1. These industries are small-scale and primarily managed by private individuals, requiring limited capital investment.
2. They employ a small number of workers, making them ideal for localized operations with minimal labor needs.

103. Name two by-products of the sugar industry. Give one use of each.

Ans : SQP 2003

1. Molasses : Used in the production of ethanol, alcohol and rum.
2. Bagasse : Used as fuel in sugar mills and as a raw material for making paper and cardboard.

104. Why is the sugar industry highly dispersed in India ?

Ans : COMP 2005

The sugar industry is highly dispersed in India because:
1. Sugarcane is grown in many regions, so mills are set up near farms to reduce transportation costs.
2. Favorable climatic conditions across various states support sugarcane cultivation.
3. Sugarcane's perishable nature requires quick processing, encouraging mills to be located near farms.

105. Mention any two features of the cotton textile industry in India.

Ans : MAIN 2009

(i) India is the third-largest cotton producer globally.
(ii) The cotton textile sector plays a crucial role in India's economy, directly or indirectly supporting nearly 40% of the country's workforce.

106. Which industry has a tendency to migrate towards the south ? Why ?

Ans : SQP 2010

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of the steel.

37. Name the largest producer of silk in India. Also mention the type of silk produced by it.

Ans : COMP 2015

Karnataka is the largest producer of silk in India. It produces Mulberry silk.

38. What are the major varieties of silk ?

Ans : SQP 2016

Mulberry, tasar, eri and muga are the four varieties of silk.

39. Name a by product of sugar industry which is used in the manufacture of wax and shoe polish.

Ans : SQP 2018

Press mud.

40. Where are the chief centres of cotton textile in India?

Ans : COMP 2017

Mumbai (Maharashtra)
Ahmedabad (Gujarat)

41. Name any two large sugar producing states, one each in north and south India.

Ans : MAIN 2013

Uttar Pradesh and Karnataka

42. Why is the cotton textile industry called an agro-based industry ?

Ans : COMP 2015

Cotton, the basic input, is obtained from agriculture.

43. State one important point of similarity between the woollen industry and the silk industry.

Ans : SQP 2015

Both are agro-based industries.

44. Name any two by-products of sugar industry.

Ans : MAIN 2005,2009,2010,2015,2019

(i) Molasses
(ii) Bagasse

45. Name a state for each of the following :
(i) Sugar industry
(ii) Mulberry silk

Ans : SQP 2001

(i) Uttar Pradesh
(ii) Karnataka

46. Which city is known as electronic capital of India? Name any three major centres of electronic products.

Ans : COMP 2009,2018

Bengaluru is known as electronic capital of India.
Major centres : Hyderabad, Delhi, Mumbai, Pune and Lucknow.

47. Name two cities that have leading Software Companies.

Ans : SQP 2013, 2014

Hyderabad and Bengaluru.

48. State the location of iron and steel industry set up with German Collaboration.

Ans : MAIN 2018

Rourkela Steel Plant.

49. Which is the largest mineral-based industry ?

Ans : SQP 2002

Iron and steel industry is the largest mineral based industry of India.

50. Name any one centres of this industry in the public sector. With whose collaboration was each one of them set up ?

Ans : COMP 2013

The Bhilai Steel Plant was built with Soviet Union collaboration.

51. Name four large-scale industries dependent on this basic industry.

Ans : COMP 2017

(i) Automobiles industry
(ii) Engineering goods industry
(iii) Shipbuilding industry
(iv) Locomotives and coaches industry.

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52. Name the basic raw materials used in iron and steel industry.

Ans : SQP 2015

The main raw materials used in iron and steel industry are iron ore, manganese, limestone, silica, chromate, feldspar, scrap iron, flux and fuel.

53. List the three basic steps involved in steel making.

Ans : COMP 2001

The three basic steps involved in steel making are as follows :
(i) Ore reduction
(ii) Steel making furnaces
(iii) Rolling mills

54. From where Durgapur Steel Plant gets its iron ore and lime stone ?

Ans : SQP 2005

Durgapur Steel Plant gets its iron-ore from Singbhum (Jharkhand) and Keoojhar (Orissa) whereas it gets limestone from Birmitrapur.

TWO MARKS QUESTIONS

55. Explain the following terms:
(a) Sericulture
(b) Integrated steel plant

Ans : MAIN 2024

(a) Sericulture : Sericulture is the cultivation of silkworms for silk production. It involves rearing silkworms, primarily on mulberry leaves and extracting silk fibers from cocoons to produce threads.
(b) Integrated Steel Plant : An integrated steel plant is a large industrial facility where all processes, from raw material processing (iron ore, coal, limestone) to finished steel production, are completed in one location.

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56. State two conditions that favour the location of cotton textile industry in Ahmedabad.

Ans : MAIN 2024

Two conditions that favour the location of cotton textile industry in Ahmedabad are :
1. Proximity to Raw Materials: Ahmedabad is located near cotton-producing regions, ensuring a steady supply of raw cotton.
2. Favorable Climate: The humid climate in Ahmedabad is well-suited for cotton spinning and weaving, preventing the cotton threads from breaking.

57. How are the industries important for India? (Two points)

Ans : MAIN 2023

Industries are important for India due to following reasons :
(a) Economic Growth : They contribute significantly to the country's GDP and provide employment opportunities, boosting the economy.
(b) Infrastructure Development : Industries drive the development of infrastructure like roads, ports and power facilities, which support further economic and social growth.

58. State the difference between Agro based industry and Forest based industry. Give one example for each type of industry.

Ans : MAIN 2023

Agro-based Industry	**Forest-based Industry**
Relies on agricultural products such as crops, fibers, or livestock for its raw materials.	Relies on forest resources like wood, resin and bamboo for its raw materials.
Example: Textile industry (cotton, jute).	Example: Paper industry (wood, bamboo).

59. What has made Mumbai an important centre for cotton textile production? (Write any two points)

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Ans : MAIN 2023

Two factors that have made Mumbai an important centre for cotton textile production are :

1. Proximity to raw materials : Mumbai is located near the cotton-producing regions of Maharashtra and Gujarat, ensuring easy access to raw cotton.
2. Favorable climate : The humid coastal climate of Mumbai is ideal for the spinning of cotton yarn, reducing breakage during the manufacturing process.

60. Why are the petrochemical products in great demand?

Ans : MAIN 2023

Petrochemical products are in great demand because they are versatile, being used in a wide range of industries, including plastics, synthetic fibers and chemicals and they are cost-effective compared to traditional materials.

61. Name any four products of petrochemical industry.

Ans : MAIN 2012

1. Plastics (e.g., polyethylene, polypropylene)
2. Synthetic fibers (e.g., nylon, polyester)
3. Fertilizers (e.g., ammonia, urea)
4. Synthetic rubber (e.g., styrene-butadiene rubber used in tires)

62. State any one advantage of locating Iron and Steel industry at Rourkela.

Ans : MAIN 2021

One advantage of locating the Iron and Steel industry at Rourkela is its proximity to iron ore reserves, especially from Odisha and Jharkhand, which reduces transportation costs for raw materials and makes production more efficient.

63. 'Most of the petrochemical units are in Maharashtra or Gujarat'. Give two reasons.

Ans : SQP 2009

1. Access to raw materials: Proximity to oil refineries provides a steady supply of crude oil and natural gas.
2. Infrastructure: Well-developed ports, transportation networks and skilled labor support efficient production and distribution.

64. What is a cottage industry ?

Ans : COMP 1997

A cottage industry is a type of business that is entirely or predominantly operated by family members, typically from their homes. Examples of cottage industries include the handloom and khadi sectors.

65. Why is it necessary to crush sugar cane within 24 hours of harvesting ?

Ans : MAIN 2001,2013,2019

Sugarcane must be crushed within 24 hours of harvesting to prevent a drop in sucrose content, which reduces sugar yield and quality. Prompt crushing ensures maximum sugar extraction.

66. "The Khadi sector of the textile industry is still very important even in this modern large-scale industrial era." Give reason.

Ans : SQP 2001,2015

The Khadi sector is important as it promotes self-reliance, sustainable rural employment and traditional craftsmanship. It is also culturally significant, symbolizing India's independence and meets growing demand for eco-friendly products.

67. State two ways by which the government has encouraged cottage industries.

Ans : COMP 2000

(i) The government offers financial support to cottage industries.
(ii) The Khadi and Village Industries Commission has been established to address their specific needs.

68. Give two reasons for the following :
"The silk handloom industry is important in Mysore."

Ans : SQP 2002,2012

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26. Visakhapatnam is the first_____based steel plant in India.
(a) nuclear power
(b) coal
(c) shore
(d) petroleum

Ans : COMP 2003

Thus (c) is correct option.

27. Visakhapatnam steel plant obtains iron ore from_____in Chhattisgarh.
(a) Korba
(b) Bailadila
(c) Talcher
(d) Durg

Ans : MAIN 2005

Thus (b) is correct option.

28. _____are organic chemicals derived from petroleum products; LPG and coal.
(a) Fossils fuels
(b) Pharmaceuticals
(c) Petrochemicals
(d) Petro derivatives

Ans : MAIN 2010

Thus (c) is correct option.

29. Which of the following are mismatched?
(a) Electronics: Kanpur
(b) Petrochemicals; Chennai
(c) Software: Bengaluru
(d) Entertainment: Mumbai

Ans : SQP 2005

Thus (c) is correct option.

ONE MARK QUESTIONS

30. Based on the ownership, what type of industry is Visakhapatnam Steel Plant?

Ans : MAIN 2024

Visakhapatnam Steel Plant is a public sector industry as it is owned and operated by the government.

31. What is meant by cooperative sector industry?

Ans : MAIN 2024

A cooperative sector industry is an industry owned and operated by a group of individuals or cooperative societies who share profits and benefits. These industries are typically established for the mutual benefit of the members, with each member having a say in the decision-making process.

32. Mention two problems faced by the Sugar industry of India.

Ans : MAIN 2023

Two problems faced by India's sugar industry are:
1. The seasonal nature of sugarcane production, leading to irregular cycles.
2. High production costs due to outdated machinery and inefficiencies.

33. Where is TATA STEEL located?

Ans : MAIN 2023

TATA STEEL is located in Jamshedpur, Jharkhand.

34. Why is the Silk industry losing the market in recent times?

Ans : MAIN 2023

The Silk industry is losing its market due to the increasing competition from synthetic fibers, which are cheaper and more readily available compared to natural silk.

35. Give an example of private and public sector industries.

Ans : MAIN 2018

Private sector industries : Tata Iron and Steel Industry, Jamshedpur.
Public sector industries : Bokaro Steel plant.

36. What are integrated steel plants ?

Ans : SQP 2007

It is a plant where all the processes are carried out in one complex from handling of raw material, steel making, rolling and shaping

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76. Name any one textile industries using animal fibres and another using plant fibres. Write against each one of them an important centre of the respective industry.

Ans : COMP 1996

Textile industries using animal fibre :
(i) Silk industry : Mysore (Karnataka)
(ii) Textile industries using plant fibre
(iii) Cotton industry : Mumbai (Maharashtra)

77. What is an agro-based industry ? State two major agro-based industries in India.

Ans : SQP 1997

An agro-based industry is an industry that uses agricultural products as its primary raw materials for manufacturing goods.
Two major agro-based industries in India are:
1. Cotton Textile Industry
2. Sugar Industry

78. State two economic advantages of the handloom industry.

Ans : MAIN 1998

1. It generates valuable foreign exchange for the country.
2. It provides additional income for farmers.

79. Discuss any three problems of the sugar industry.

Ans : MAIN 2012,2015

1. The sugarcane produced is of inferior quality, possessing a low sugar concentration.
2. Transportation facilities are limited and not readily accessible.
3. The sugar mills are small-scale and operate uneconomically, reducing overall efficiency.

80. Give two reasons to show why the sugar industry has flourished in Uttar Pradesh and Bihar.

Ans : SQP 2002

1. The fertile plains with heavy rainfall support extensive sugarcane cultivation in the region.
2. Coal, the primary energy source for sugar industries, is readily available from nearby coal mines in Bihar.

81. Name four sugar milling centres in the northern plains.

Ans : MAIN 2008

1. Meerut (Uttar Pradesh)
2. Muzaffarnagar (Uttar Pradesh)
3. Gorakhpur (Uttar Pradesh)
4. Lucknow (Uttar Pradesh)

82. Give two reasons for the importance of the silk industry in India.

Ans : SQP 2008

(i) India generates foreign exchange through silk exports.
(ii) The silk industry offers employment opportunities to both skilled and unskilled workers.

83. Give three factors that favour the cotton industry in Kolkata.

Ans : COMP 2008,2014

(i) Easy access to raw materials.
(ii) A climate conducive to cotton manufacturing.
(iii) Readily available capital for investment.

84. Explain two factors affecting the development of the cotton textile in India.

Ans : COMP 2009

(i) Raw Material : India, being the second-largest cotton producer globally, has access to abundant and affordable raw cotton.
(ii) Labour : The cotton textile industry is labor-intensive and India provides a large pool of both skilled and unskilled labor at low costs.

85. With reference to the silk industry, answer the following :
(i) Why is Karnataka the largest producer of mulberry silk ?
(ii) Name one silk weaving centre each in U.P. and in Tamil Nadu.

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Ans : MAIN 2016, 2018, 2019

(i) Karnataka benefits from favorable climatic conditions for silkworm rearing and has a strong base of skilled workers essential for silk production.
(ii) (a) Uttar Pradesh : Gorakhpur
(b) Tamil Nadu : Chennai

86. The 'Khadi' and Handloom sectors of the textile industry cannot be ignored. Give two reasons to justify the statement.

Ans : SQP 2004, 2019

(i) It offers job opportunities to both skilled and unskilled workers.
(ii) It eases pressure on agriculture and provides additional income for farmers.

87. Explain why :
(i) Carpet-making as a cottage industry has developed in the Kashmir valley.
(ii) The pure silk handloom industry is important in Bengaluru.

Ans : COMP 1998, 2013

(i) Carpet-making has thrived as a cottage industry in the Kashmir Valley primarily because sheep are bred there for their wool. The wool waste generated is a vital material for weaving carpets. Additionally, the region benefits from the presence of skilled craftsmen who contribute to the industry's growth.
(ii) Karnataka is well-known for its sericulture industry, which accounts for approximately two-thirds of India's raw silk production.

88. Give three reasons to explain why there is a need for rapid industrialisation in India.

Ans : MAIN 2000

(i) To increase national and per capita income.
(ii) To eliminate unemployment and underemployment.
(iii) Industrialization is essential for addressing regional imbalances.

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89. The Iron and Steel industry constitutes the backbone of modern industrial economy'. Give two reasons to justify the statement.

Ans : SQP 2017

(i) Provision of Essential Machinery: The iron and steel industry supplies the necessary machinery required for the manufacturing of a diverse range of goods.
(ii) Foundation for Various Industries: Many other sectors, including automobiles, locomotives, rail tracks, shipbuilding, machinery manufacturing, bridges, dams and numerous commercial activities, rely heavily on the iron and steel industry.

90. The Mumbai-Pune region is the most important industrial region of India. Substantiate the statement giving two reasons.

Ans : SQP 2007

Mumbai and Pune are the foremost hubs for cotton textiles, with over 70 mills operating in the region. Additionally, these cities are significant centers for the chemical industry. Moreover, the area plays a crucial role in the electronics sector as well.

91. What are petrochemicals ?

Ans : MAIN 2008,2012,2015

Petrochemicals are chemical products derived from petroleum or natural gas. They serve as raw materials for a wide range of products such as plastics, synthetic fibers, rubber, fertilizers, detergents and industrial chemicals. Petrochemicals are essential components in industries like manufacturing, agriculture and healthcare.

92. Why is iron and steel industry called a basic and heavy industry ?

Ans : MAIN 2015

The iron and steel industry is called a basic and heavy industry because it supplies essential raw materials for other industries and involves large-scale production using heavy machinery and raw materials like iron ore and coal.

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93. Explain the term 'mini steel plant'.

Ans : SQP 2001, 2015

Mini steel plants are smaller steel manufacturing units that do not carry out all processing at a single location. These plants require less capital investment and primarily use steel scrap in electric furnaces, promoting recycling and reducing coal consumption.

94. Why is this industry concentrated in the Chhota Nagpur region ? Which is the oldest and privately owned plant ?

Ans : COMP 2007

This industry is concentrated in the Chhota Nagpur region for the following reasons :

(a) The raw materials, such as iron and coal, are heavy and bulky, so the industry is located close to their sources, which are abundant in this area.

(b) The region has a dense population, providing access to cheap labor.

The Tata Iron and Steel Company (TISCO) in Jamshedpur is the oldest and privately owned steel plant.

95. With reference to the small scale industries answer the following questions:

(i) Give two advantages of setting up mini steel plants.

(ii) Mention one major problem of small-scale industries.

Ans : MAIN 2000

(i) Two advantages of setting up mini steel plants :

(a) Mini steel plants require less capital investment compared to large integrated plants.

(b) They use electric furnaces, which reduce coal consumption and contribute to its conservation.

(ii) Productivity is low and inefficient due to the use of outdated machinery and equipment in mills.

96. Name two raw material used in the petrochemical industry. What are advantages of petrochemical products over traditional products ?

Ans : MAIN 2005, 2008, 2014, 2016, 2018

Raw materials used in the Petrochemical Industry:

1. Crude Oil
2. Natural Gas

Advantages of Petrochemical Products Over Traditional Products :

1. Durability : Petrochemical products, such as plastics, are more durable and resistant to wear compared to traditional materials like wood or glass.
2. Cost-Effectiveness : These products are often cheaper to produce and transport due to their lightweight and mass production capabilities.

97. Write Short Note on Micro Enterprise and Medium Enterprise.

Ans : SQP 2000

A micro enterprise is defined as a business venture where the investment in plant, machinery, or equipment does not exceed one crore rupees. Additionally, the enterprise maintains an annual turnover that does not surpass five crore rupees.

A medium enterprise refers to a business entity in which the investment in plant, machinery, or equipment is capped at fifty crore rupees. Furthermore, the annual turnover of such an enterprise does not exceed two hundred and fifty crore rupees.

98. Write Short Note on Heavy and Light industries.

Ans : SQP 2004

Heavy Industry: This industry uses heavy raw materials, such as iron and steel and includes sectors like heavy machinery manufacturing.

Light Industry: This industry uses lighter raw materials, such as those used in the woollen and pharmaceutical industries.

99. Write Short Note on Basic and Secondary industries.

Ans : MAIN 2004

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1. Karnataka is the largest silk producer, ensuring an abundant and easily accessible supply of raw material for the silk handloom industry.
2. The region has ample soft water, free from alkaline salts and iron, which is crucial for high-quality silk production.

69. The largest proportion of industrial workers is found in the textile industry. Give reasons.

Ans : COMP 2019

1. Labor-Intensive Nature : The textile industry involves multiple stages like spinning, weaving, dyeing and stitching, all of which require a significant amount of manual labor, leading to high employment.
2. Widespread Presence : The textile industry is spread across urban and rural areas, with a large number of small, medium and large-scale units, which collectively employ a vast workforce.

70. Give reason for the following :
(i) Cottage industries are significant for our economy.
(ii) Petrochemical industries are usually located close to the oil refineries.

Ans : SQP 2019

(i) They require less capital, making them well-suited for our economy.
(ii) They source their raw materials directly from oil refineries.

71. Why is the silk industry considered as a small-scale industry ?

Ans : MAIN 2009

The silk industry is considered small-scale due to its labor-intensive production, low capital investment and operation through small, family-run units, especially in rural areas.

72. Name an agro-based industry based in the following industrial centres :
(i) Ahmedabad
(ii) Mysore

Ans : SQP 2013

(i) Ahmadabad: Cotton Textile Industry
(ii) Mysore: Silk Industry

73. With the help of example differentiate between basic and consumer industries.

Ans : SQP 2004

Basic	Consumer
It is the industry on which other industries depend.	The industry which produces goods primarily for the direct consumption by the people is called consumer industry.
Iron and steel industry is the major basic industries.	Automobile industry, textile industry are the main consumer industries.

74. Give two seasons why Mumbai is an important Cotton textile industry.

Ans : MAIN 2017,2002

1. Access to Raw Materials : Mumbai is close to cotton-growing regions, ensuring a steady supply of raw cotton for the textile industry.
2. Port Facility : Mumbai's port provides easy access for importing machinery and exporting finished products, facilitating trade and growth in the cotton textile sector.

75. Why are the cotton textile industries mostly located in the coastal areas.

Ans : SQP 2022

1. Proximity to Ports : Coastal locations provide easy access to ports, which facilitates the import of machinery and export of finished textile products, improving trade efficiency.
2. Favorable Climate : Coastal areas have a humid climate, which is ideal for cotton spinning and weaving, as it helps prevent the cotton fibers from breaking.

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The sugar industry migrates south due to:
1. Favorable climate: Longer crushing season and higher sugar content.
2. Better fertilizer use: Leads to higher yields.
3. Cooperative sector: Ensures better management and farmer returns.

107. Explain why the woollen industry is concentrated in north India.

Ans : COMP 2007

About 80 percent of woollen mills are located in North India due to the following factors:
(i) India is largely tropical, but North India experiences cold winters, creating a high demand for woollen products.
(ii) Sheep rearing is prevalent in northern states like Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan and Uttar Pradesh, ensuring an easy supply of raw materials.

108. (i) Why is it necessary to crush sugarcane within 24 hours of harvesting ?
(ii) Name a by-product of sugar manufacture.

Ans : COMP 2015

(i) It is necessary to crush sugarcane within 2 hours of harvesting because the sucrose content in the cane begins to deteriorate quickly after cutting, reducing sugar yield and quality.
(ii) A by-product of sugar manufacture is molasses.

109. State four geographical factors which should be kept in mind while setting up an agro-based industry.

Ans : MAIN 2022

Four geographical factors for setting up an agro-based industry are:
1. Proximity to raw materials.
2. Suitable climate for processing.
3. Availability of water for production.
4. Good transportation for moving raw materials and finished goods.

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110. State two steps taken by the government to overcome the problems faced by the jute industry in India.

Ans : MAIN 2021

1. Mandatory jute packaging for certain products like food grains and sugar.
2. Financial assistance for modernizing jute mills to enhance efficiency and competitiveness.

111. Mention two problems faced by the sugar industry in India.

Ans : SQP 2023

(i) Sugarcane farms are located at a significant distance from the sugar mills.
(ii) The sugarcane crushing season is short, making the sugar industry operate on a seasonal basis.

112. Mention three factors that favour the concentration of the cotton textile mills in Mumbai.

Ans : MAIN 2000

(i) Rich Hinterland-providing the raw material for cotton industry.
(ii) Hot humid climate
(iii) Soft clean water
(iv) Harbour facility
(v) Rail road transport facilites.

113. State two reasons why cottage industries have developed in many parts of India? Give the names of two important cottage industries.

Ans : SQP 2023

1. Abundant Skilled Labor : India has a rich tradition of skilled artisans and craftsmen, especially in rural areas, enabling the growth of cottage industries.
2. Low Capital Investment : Cottage industries require minimal capital and can be operated with simple tools and locally available resources.

Two important cottage industries are handloom weaving and pottery.

114. Which do you consider to be the most important industrial zone ? Give two reasons.

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content. Additionally, the region enjoys a longer crushing season due to favorable weather.

(ii) Sugarcane depletes soil nutrients, but the use of fertilizers is more prevalent in the south, resulting in higher sugar yields compared to northern India.

(iii) Many sugar mills in the south operate in the cooperative sector, promoting better worker participation and offering higher dividends.

138. Discuss any three problems of cotton textile industry.

Ans : COMP 2007,2016,2018

(i) Problem of raw material : 'Long staple' fibre is best fibre but most of the cotton grown in India is the 'short staple' fibre.

(ii) International competition : Countries like Taiwan, South Korea and Japan are giving a stiff competition.

(iii) Outdated machinery and technology : Due to outdated machinery and technology cost of production is high. So India is not in a position to face the international competition.

139. Mention three factors that favour the concentration of the cotton textile mills in Mumbai.

Ans : COMP 2006,2010,2019

1. Availability of Raw Materials : This region benefits from large-scale cotton production, ensuring a steady and reliable supply of raw materials essential for the textile industry.
2. Favorable Climate : The area enjoys an equitable climate that is conducive to cotton cultivation, promoting consistent and high-quality cotton yields.
3. Export Facilities : Mumbai, being India's primary seaport, provides excellent infrastructure for importing high-quality cotton and machinery. It also facilitates the efficient export of finished textile products to global markets.
4. Access to Capital : Adequate financial resources are readily available in these regions, supporting the establishment and expansion of textile businesses and reducing financial barriers for industry growth.

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140. What do you mean by agro-based industries? Name a few of them and also state their significance in Indian economy.

Ans : MAIN 2007

Agro-based industries rely on agriculture for their raw materials, transforming agricultural products into industrial goods. Examples include textile, sugar, jute, vegetable oil, paper and plantation industries.

Significance:

1. These industries generate employment for a large number of people.
2. They produce consumer goods and contribute to the economy by earning valuable foreign exchange.

141. Name two products of each of the following industries :

(i) Petrochemical industry

(ii) Heavy engineering industry

(iii) Electronic industry

Ans : SQP 2017

(i) Petrochemical Industry : Plastics, Synthetic fibers.

(ii) Heavy Engineering Industry : Machinery, Shipbuilding.

(iii) Electronic Industry : Computers, Televisions.

142. Mention three advantages that a mini steel plant has over an integrated steel plant.

Ans : MAIN 2012,2016

1. Most mini steel plants are situated away from integrated steel plants, allowing them to cater to local demand.
2. They use scrap or sponge iron from large steel plants as raw material, helping recycle iron and turn scrap into profitable resources.
3. Requiring less investment, they are well-suited for India's economic conditions.

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Ans : MAIN 2002

The localization of the cotton textile industry in Mumbai and Ahmedabad is favored by:

1. Proximity to cotton-growing regions, ensuring easy access to raw materials.
2. Favorable humid climate, ideal for spinning cotton yarn.
3. Port facilities in Mumbai for easy trade.
4. Availability of skilled labor and strong transportation networks.
5. Access to capital from financial institutions.

122. Name the main steel-using industries of India.

Ans : COMP 2002

The main industries that use steel include machine tools, automobiles, shipbuilding, aircraft manufacturing, consumer goods, scientific machinery and instruments and stainless steel utensils.

123. Name two Iron and Steel Plants, which existed in India before 1947 and two such plants which were set up after 1947

Ans : SQP 2003

Iron and Steel Plants before 1947:

1. Tata Iron and Steel Company (TISCO) : Jamshedpur, established in 1907.
2. Indian Iron and Steel Company (IISCO): Burnpur, established in 1919.

Iron and Steel Plants after 1947:

1. Bhilai Steel Plant : Chhattisgarh, established in 1959.
2. Rourkela Steel Plant : Odisha, established in 1959.

124. Which is the largest mineral-based industry in India ? Why is it called the backbone of all industry ?

Ans : MAIN 2013

The largest mineral-based industry in India is the Iron and Steel Industry. It is considered a key and basic industry because it supplies essential iron and steel products for a wide range of uses, including house construction, utensils and machinery. From small tools to heavy machinery, every industry depends on iron and steel, making it the foundation of industrial development.

125. What is an integrated steel plant ? Give one example.

Ans : SQP 2003

An integrated steel plant is one where all the three processes from melting of iron in the blast furnace to steel making followed by shaping of the metal by rolling is carried out under one complex.

126. State any three factors which affect the location of an integrated steel plant.

Ans : COMP 2006

1. Proximity to raw materials like iron ore and coal.
2. Access to water for industrial processes.
3. Good transportation links for raw materials and products.

127. How is it advantageous for a mini steel plant:
(i) to use electric furnaces ; and
(ii) to be located far from the source of the raw materials ?

Ans : SQP 2017

(i) Use of Electric Furnaces : They are energy-efficient, cost-effective for small-scale production and can use scrap metal instead of iron ore.

(ii) Location Far from Raw Materials : Being near markets lowers transportation costs for finished goods and reliance on scrap metal reduces dependency on raw material sources.

128. Name the steel plant located in Andhra Pradesh. What two advantages this steel plant have over the other steel plants in the public sector ?

Ans : COMP 2014

The Visakhapatnam Steel Plant (Vizag Steel Plant) is located in Andhra Pradesh.

1. Proximity to a Port : Being near Visakhapatnam Port facilitates easy import of raw materials and export of finished products, reducing transportation costs.

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Ans : SQP 2000

The North-Eastern Industrial Zone is regarded as the most important industrial zone due to the following reasons:
(i) The region has abundant mineral resources, including iron ore, coal, manganese and bauxite.
(ii) The fertile Ganga and Brahmaputra plains offer ideal land for producing bamboo, sabai grass, timber and jute, supporting a range of industries.

115. What factors affect the location of an integrated steel plant?

Ans : SQP 2017

Following factors affect the location of an integrated steel plant :
(i) Availability of raw materials.
(ii) Power supply
(iii) Water supply
(iv) Labour force
(v) Market
(vi) Transport Facilities.

116. Differentiate between an integrated steel plant and a mini steel plant.

Ans : SQP 2022

Integrated Steel Plant	**Mini Steel Plant**
Produces steel from basic raw materials like iron ore and coal.	Primarily uses scrap steel or sponge iron as raw materials.
Involves the entire steel-making process from raw materials to finished products.	Focuses on specific stages of steel production, not all processes.
Requires large capital investment and is typically large in scale.	Requires less capital investment and is smaller in scale.

117. Name five important factors responsible for the localisation of manufacturing industries.

Ans : MAIN 2020

The following factors are responsible for the localisation of manufacturing industries :
(i) Availability of raw materials,
(ii) Adequate supply of power,
(iii) Water supply,
(iv) Adequate supply of labour and
(v) Transportation.

118. From where Bokaro Steel Plant obtains its raw materials?

Ans : SQP 2022

The Bokaro Steel Plant sources its coal from the Bokaro and Jharia coalfields, iron ore from the Kiriburu mines in Keonjhar district (Odisha), limestone from Bhavantpur and dolomite from Palamau (Jharkhand).

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119. Name the units for the production of railway locomotives and coaches.

Ans : COMP 2000

1. Chittaranjan Locomotive Works (CLW) : Located in West Bengal, it manufactures electric locomotives.
2. Diesel Locomotive Works (DLW) : Located in Varanasi, Uttar Pradesh, it manufactures diesel locomotives.
3. Integral Coach Factory (ICF) : Located in Chennai, Tamil Nadu, it produces railway coaches.
4. Rail Coach Factory (RCF) : Located in Kapurthala, Punjab, it manufactures railway coaches.

120. What is a mini steel-plant ? What are its advantages?

Ans : SQP 2001

A mini steel plant is a small to medium-sized facility that uses electric furnaces and relies on scrap or sponge iron as raw materials. Currently, there are 216 mini steel plants. The key advantages of mini steel plants include the efficient use of scrap iron, saving coking coal by using electric furnaces and promoting the production of alloy steel.

121. What important factors have favoured the localization of the cotton textile industry in Mumbai and Ahmedabad.

133. Name three by-products of sugar industry. Give one important use of each.

Ans : COMP 2005,2009,2010

1. Molasses is utilized as an organic fertilizer, cattle feed, fuel for mills and as a raw material in the production of paper and fiberboard.
2. Bagasse serves as an organic fertilizer, cattle feed, mill fuel and is used as a raw material in the manufacturing of paper, fiberboard and synthetic fibers for the textile industry.
3. Press Mud is employed in the creation of shoe polish, carbon paper and wax.

134. Mention any four factors which influence the location of industries, giving one example of each.

Ans : SQP 2005

(i) Raw Material : Raw materials are essential inputs for any industry. Consequently, many industries are situated close to their raw material sources. For example, the majority of jute mills are located in West Bengal, adjacent to the Hooghly River.

(ii) Transport : Efficient transportation is crucial, especially for heavy and bulky raw materials. Mumbai, Maharashtra, exemplifies this as the largest cotton textile hub, benefiting from its extensive rail and port facilities.

(iii) Market : Consumer-oriented industries are typically established near major cities where robust markets exist. For instance, the vegetable oil industry is primarily located near large urban centers to ensure easy access to consumers.

(iv) Finance : Financial resources are fundamental to all industries. Mumbai stands out as a major center for the cotton textile industry because it is a prominent financial and commercial hub.

135. Distinguish between agro-based and mineral-based industries.

Ans : COMP 2003,2017,2022

Agro-based Industries	**Mineral-based Industries**
Use agricultural products as their primary raw materials.	Use minerals and metals as their raw materials.
Examples include sugar, cotton textile and jute industries.	Examples include iron and steel, cement and aluminum industries.
Generally labor-intensive, often located in rural areas.	Capital-intensive, usually located near mining areas or industrial hubs.
Support the agricultural sector by processing crops.	Support the industrial sector by providing materials for construction, machinery and tools.

136. (i) Give one reason to explain why cottage industries play an important role in India's development.

(ii) State two ways by which the government has encouraged cottage industries.

Ans : MAIN 1997,2000

(i) Cottage industries provide employment, require minimal capital investment and offer farmers a supplementary income during non-farming seasons.

(ii) The government supports cottage industries by :

(a) Providing improved tools and equipment at subsidized rates.

(b) Offering loans, incentives and affordable raw materials.

137. Which agro-based industry has a tendency to migrate towards the south in India ? Give reasons to justify your answer.

Ans : SQP 1997,2014

The sugar industry in India is shifting towards the south for the following reasons :

(i) The tropical climate of southern India is ideal for sugarcane cultivation, producing thicker, sweeter cane with higher sugar

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(i) Sugarcane is a weight-losing crop, meaning its sucrose content decreases over time. As a result, it must be crushed within 2 hours of harvesting to preserve its sugar content.
(ii) Uttar Pradesh, once the largest sugar producer, has been overtaken due to outdated mills, labor and management issues and a shorter crushing season.
(iii) Ahmedabad is called the 'Manchester of India' due to its resemblance to Manchester, UK, which is known for its cotton textile industry. Ahmedabad, like Manchester, has a climate suitable for spinning fine cotton thread and is located on the banks of the Sabarmati River, whose water is favorable for dyeing textiles.

155. Discuss the problems of the sugar industry in India at present.

Ans : COMP 2007

The sugar industry operates on a seasonal basis, preventing year-round employment for laborers. This seasonal nature reduces worker efficiency and continuity.
(i) Sugarcane is predominantly cultivated by small-scale farmers who sell their harvest directly to mill owners. This direct selling model results in lower financial returns for the farmers.
(ii) In certain regions of the country, delays in transporting sugarcane to mills lead to a reduction in sugar content, adversely affecting the quality of the final product. Prevalence of Low-Quality
(iii) A significant portion of sugarcane grown in northern India is of inferior quality, which negatively impacts overall sugar production efficiency and output.
(iv) Many sugar mills are outdated, employing inefficient and uneconomical production methods. This lack of modernization hampers productivity and increases operational costs
(v) The by-products generated by the sugar industry are not being effectively utilized, leading to wastage and missed opportunities for additional revenue streams.

156. What are the four special features of the cotton textile industry in India ?

Ans : MAIN 2007

(i) Major Employer : It provides large-scale employment across the country.
(ii) Widespread Presence : The industry is spread across various states like Maharashtra and Gujarat.
(iii) Abundant Raw Material : India is a major cotton producer, ensuring a steady supply.
(iv) Export Contributor : Cotton textiles are a significant part of India's exports.

157. State any three problems faced by sugar industry.

Ans : COMP 2008

Problems faced by the sugar industry :
(i) The sugar industry is seasonal, meaning labor cannot be employed year-round, leading to reduced worker efficiency.
(ii) Sugarcane is typically grown by small farmers who sell directly to mill owners, resulting in lower returns for the farmers.
(iii) Delays in transporting sugarcane to mills in some regions lead to a reduction in the sugar content of the produce.

158. What is meant by the term sericulture ? State the factors responsible for the concentration of silk industry in Kanataka.

Ans : SQP 2009

Sericulture : The process of rearing silkworms for the production of silk is known as sericulture.
The factors contributing to the concentration of the silk industry in Karnataka are:
(i) The region has a favorable climate for silkworm rearing.
(ii) Mulberry plants, grown as plantation bushes, are readily available.
(iii) Karnataka has an ample supply of soft water, free from alkaline salts and iron, essential for silk production.

NODIA

143. State the importance of electronic industry in the field of :
(a) Space technology
(b) Entertainment.

Ans : MAIN 2008,2012,2013,2016

(a) Space Technology : The electronic industry plays a crucial role in developing advanced components for satellites, communication systems and spacecraft, enabling accurate data transmission and supporting space exploration and research.

(b) Entertainment : The electronic industry provides essential devices such as televisions, radios, smartphones and gaming consoles, revolutionizing the entertainment sector by making it more accessible, diverse and interactive.

144. (i) What do you understand by mini steel plants?
(ii) Mention the advantages and disadvantages of mini steel plants.

Ans : SQP 2008,2017

(i) Mini steel plants are smaller facilities that do not carry out all processing in one location. They require less capital investment and are smaller in scale.

(ii) Advantages of mini steel plants :
1. They need less capital investment.
2. They use scrap iron from large steel plants as raw material, promoting iron recycling.
3. Due to their small size, they can be set up in various locations.

Disadvantages of mini steel plants:
1. Production is not on a large scale, leading to higher production costs.
2. Large machines cannot be manufactured in mini steel plants.

145. (i) Give two reasons to explain why there is a need for rapid industrialisation in India.
(ii) Mention two major problems of small-scale industries.

Ans : MAIN 2000

(i) Two reasons for the need for rapid industrialization in India are :
(a) Industrialization is critically needed to address India's issues of unemployment and poverty. By expanding industrial activities, these socio-economic problems can be effectively mitigated.
(b) India exhibits significant regional disparities, with some areas being highly developed while others remain underdeveloped. Industrial growth can help achieve a more balanced regional development across the country.

(ii) Two major problems of small-scale industries:
(a) Small-scale industries are encountering fierce competition from larger-scale industries, making it challenging for them to sustain and grow.
(b) There is a scarcity of crucial inputs such as raw materials, power and capital, which hampers the growth and efficiency of industrial operations.

146. Give a reason for each of the following :
(i) Mini Steel plants cause less pollution than integrated steel plants.
(ii) The electronic industry has made an impact on both entertainment and education.

Ans : COMP 2014

(i) Mini steel plants cause less pollution as they use electric and induction furnaces for processing, which are cleaner than traditional methods.

(ii) The electronic industry has provided products like televisions, computers, laptops, tablets, radios and DTH systems. These devices have become key sources of both entertainment and education. They enable easy access to information and its sharing through the internet. Additionally, tools like iPads, CDs, smart classes and e-books have revolutionized learning and knowledge-sharing.

NODIA

147. Regarding the Rourkela Steel Plant answer the following :
(i) Name the state in which it is located.
(ii) Name any three products of the plant.
(iii) from where it gets :
(a) Iron ore
(b) Coal
(c) Limestone
(d) Manganese
(e) Power
(f) Water
(g) The foreign collaborator of the iron and steel plant at Rourkela.

Ans : SQP 2017

(i) The Rourkela Steel Plant is located in Odisha.
(ii) (a) Hot-rolled coils
(b) Plates
(c) Cold-rolled sheets
(iii) (a) Iron ore : Sourced from Bonaigarh, Mayurbhanj and Keonjhar districts.
(b) Coal: Supplied by Raniganj, Jharia and Talcher.
(c) Limestone : Obtained from Birmitrapur and Hirri.
(d) Manganese : Sourced from Noamundi, Keonjhar, Barajanda and Sundargarh.
(e) Power : Supplied by the Hirakud power project.
(f) Water : Met by the Brahmani River.
(g) Collaborator: Germany.

148. Give a geographical reason for each of the following:
(i) Sugar mills are located close to sugarcane growing areas.
(ii) Mumbai is known as the 'Cottonopolis of India'.
(iii) The Silk industry has a small market.

Ans : MAIN 2000

(i) Sugar mills are strategically situated close to sugarcane plantations because the juice extracted from harvested sugarcane begins to dry within 1 hours after harvesting. Consequently, it is crucial to transport the sugarcane rapidly to the mills to maintain its quality and prevent juice loss.
(ii) Mumbai is often referred to as the "Cottonopolis of India" due to the high density of cotton mills concentrated in the city. This significant clustering makes Mumbai the central hub for the cotton textile industry in the country.
(iii) The silk industry is regarded as a small-scale industry because silk production predominantly takes place in rural regions where conditions are ideal for rearing silkworms. Additionally, the availability of affordable labor in these areas supports the small-scale nature of silk cultivation and processing.

149. Give a geographical reason for each of the following :
(i) India produces very little cane-sugar though it is one of the largest producers of sugarcane in the world.
(ii) Higher output of sugar in South India.
(iii) Sericulture flourishes in Karnataka.

Ans : SQP 2001

(i) The sugarcane cultivated in India is of thin quality with low sugar content, resulting in the country's cane sugar production constituting only five percent of the global output.
(ii) Tamil Nadu boasts higher per hectare yields of sugarcane, elevated sucrose content and a longer crushing season. These factors, combined with the implementation of new machinery, have led to an increased sugar production in the state.
(iii) Karnataka offers an ideal climate that supports the effective rearing of silkworms, essential for sericulture. The region has an ample supply of soft water, free from alkaline salts and iron, which is crucial for successful sericulture operations.

150. Name five of the important iron and steel plants in India and give a brief description of the factors which have favoured their location and development.

Ans : COMP 2002

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Steel Plant	Favourable Factors
Durgapur Steel Plant	Coal from Raniganj, iron ore from Singhbhum navigation and railway Transport facility, water from Damodar river
Bokaro Steel Plant	Coal from Jharia, iron ore from Singhbhum, water from Tenughat river
Rourkela Steel Plant	Coal from Talcher, iron ore from Mayurbhanj, water from Brahmani river
Bhilai Steel Plant	Coal from Korba, iron from Balaghat, Durg, water from Tendula river
Mysore Steel Plant (Bhadravati)	Coal from nearby charcoal, iron ore, from Chitaldurg, Kundremukh etc., water from Bhadravati river

151. With reference to industries of India, explain:
(i) Footloose Industries
(ii) Private Sector Industries.
(iii) Joint Sector Industries.

Ans : MAIN 2003

(i) Footloose Industries : These industries are not tied to any specific location since their raw materials are widely available and their finished products can be marketed anywhere. Examples include soap, toys and cosmetics.
(ii) Private Sector Industries : These industries are owned and operated by individuals or private firms. An example is the Tata Iron and Steel Company (TISCO) in Jamshedpur.
(iii) Joint Sector Industries : These industries are jointly owned by the government and private individuals, though management is typically in private hands.

152. What is sericulture ? State any two problems faced by the silk industry

Ans : SQP 2004

The rearing of silkworms and the production of raw silk is known as sericulture.

Problems faced by the Silk Industry:
(i) The Indian silk industry faces strong competition from artificial silk, which is more affordable and often of better quality.
(ii) The import of cheaper and higher-quality raw silk from China poses a significant challenge to the Indian silk industry.

153. State any two geographical features favourable for setting an industry.

Ans : COMP 2005

(i) Raw Materials : The availability of raw materials is a key factor in determining the location of industries. Early industries in India developed near raw material sources. For example, textile mills in Mumbai sourced cotton from Gujarat and jute mills in the Hooghly region obtained jute from the Ganga delta.
(ii) Water Supply : Industries require water for various processes such as manufacturing, cleaning, cooling and washing. Fresh water is crucial for industries like iron and steel (cooling), textiles (bleaching and washing), paper, chemicals, food processing and jute.
(iii) Energy : Continuous energy is essential for converting raw materials into finished products. Industries like iron and steel are often located near coal resources, while energy-intensive industries, such as electro-metallurgical and electrochemical sectors, are established where electricity is abundant. In regions lacking coal, hydropower is often used to sustain industrial activity. Availability of energy plays a critical role in the location of industries.

154. Give a geographical reason for each of the following :
(i) Sugarcane is a weight losing commodity.
(ii) Uttar Pradesh has been relegated to second place in terms of sugar production.
(iii) Ahmedabad is known as the 'Manchester of India'.

Ans : SQP 2006

NODIA

2. Modern Technology : It was set up using advanced and modern technology, leading to greater efficiency and higher-quality steel production.

THREE MARKS QUESTIONS

129. Give one reason to explain each of the following:
(i) Mini-steel plants help in conservation of coal.
(ii) Location of sugar industry is shifting to the southern part of India.
(iii) The electronic industry is growing at a fast rate.

Ans : MAIN 2024

(i) Mini-steel plants help in the conservation of coal because they primarily use electric arc furnaces, which rely on electricity rather than coal, thereby reducing the consumption of coal in steel production.
(ii) The location of the sugar industry is shifting to the southern part of India due to better climatic conditions for sugarcane cultivation, longer crushing seasons and higher sucrose content in the sugarcane grown in southern states like Karnataka and Maharashtra.
(iii) The electronic industry is growing rapidly due to increasing demand for electronic goods, advancements in technology and government initiatives to promote manufacturing and innovation in the sector.

130. Give four reasons to justify that the rayon textile industry in India has a great future.

Ans : SQP 2003

(i) Raw Material : The primary raw material for producing viscose yarn is cellulose pulp, derived from bamboo, eucalyptus and other softwood trees, which are abundantly available.
(ii) Chemicals : Essential chemicals like caustic soda and sodium sulphate are easily accessible.
(iii) Water Supply : The industry requires large amounts of water, which is readily available from nearby rivers.
(iv) Research and Development : Adequate research and development facilities are in place, with major production centers in Mumbai, Ahmedabad, Surat, Hyderabad, Coimbatore, Kolkata, Gwalior, Delhi and Amritsar.

131. Give reasons why iron and steel industry in India is concentrated around Chhota Nagpur plateau region.

Ans : SQP 2013

Most of the iron and steel plants are located on the Chhota Nagpur Plateau due to the following reasons:
(i) The plateau is well-known for its abundant iron ore deposits, with Bihar, Bengal and Jharkhand supplying the necessary raw materials.
(ii) Coal, a crucial fuel for steel production, is readily available in this region.
(iii) The densely populated area provides an ample supply of affordable labor.
(iv) The Damodar Valley Corporation supplies power to the plants.
(v) Kolkata Port offers convenient export and import facilities for the industry.

132. Why is sugar industry located in U.P. ? Give three reasons.

Ans : MAIN 2007

The sugar industry is primarily located in Uttar Pradesh due to the following reasons:
1. Abundant Raw Material : Uttar Pradesh is one of the largest producers of sugarcane, providing a steady supply of raw material for sugar mills.
2. Favorable Climate : The climate of U.P. is ideal for the cultivation of sugarcane, with adequate rainfall and fertile alluvial soil.
3. Availability of Labor : The densely populated state ensures a continuous supply of cheap and skilled labor, essential for the labor-intensive sugar industry.

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(iv) The silkworm species Bombyx mori, which can be reared year-round, is available in abundance.

159. State any three differences between the sugar industry of Northern and Peninsular India.

Ans : MAIN 2010

Sugar Industry in Northern India	Sugar Industry in Peninsular India
Has a temperate climate with lower yields of sugarcane.	Tropical climate with black soil, higher temperatures and frost-free conditions result in higher yields.
Cooperative sugar mills are less efficiently managed.	Cooperative sugar mills are better managed and more efficient.
Sugarcane has lower sucrose content.	Sugarcane has a higher sucrose content, improving overall production.

160. Name the main source of power for each industrial zone.

Ans : SQP 2011

(i) North-Eastern Industrial Zone Power Sources: The Damodar Valley Project and the Hirakud Project supply both thermal and hydroelectric power to this region.

(ii) Western Industrial Zone Power Sources: This zone benefits from a diverse energy mix, including thermal power, hydroelectric power and atomic energy.

(iii) Northern Industrial Zone Power Sources: The region primarily relies on thermal and hydroelectric power for its industrial activities. Southern Industrial Zone Power Sources:

(iv) Hydroelectric power from the Mettur and Pykara projects, the Mahatma Gandhi and Sharavati Hydroelectric Projects, along with atomic power from the Kalpakkam Atomic Power Station, serve as the main energy sources.

(v) Central Industrial Zone Power Sources: This zone is powered by a combination of thermal and hydroelectric energy generated within the region.

161. For each industrial zone name its two main industries.

Ans : COMP 2012

The two main industries in different industrial zones are as follows:

(i) North-Eastern Industrial Zone: Iron and steel, jute.

(ii) Western Industrial Zone: Cotton textiles, cement.

(iii) Northern Industrial Zone: Sugar, chemicals.

(iv) Southern Industrial Zone: Electrical machinery, automobiles.

(v) Central Industrial Zone: Paper, heavy chemicals.

162. What are the disadvantages of the North-Eastern Industrial Zone ?

Ans : SQP 2013

The disadvantages of the North-Eastern Industrial Zone are as follows :

(i) After India's partition, the North-Eastern jute industry was severely impacted as most jute-growing areas went to Bangladesh.

(ii) The tea industry also suffered as Assam was cut off from Kolkata.

(iii) Siltation of the Hooghly River has increased maintenance costs for Kolkata port, while substitutes like paper, hemp, sisal and synthetics have reduced jute's dominance as a packaging material.

(iv) Outdated machinery and work processes have led to lower productivity, causing India's jute industry to struggle against global competition.

163. Name the chief industrial zones of India. Choose one of these zones and name three main industries in the region named by you.

Ans : COMP 2014

NODIA

ONE MARK QUESTIONS

37. Give two reasons why peninsular rivers are not ideal for navigation.

Ans : SQP 2013

(i) These are not perennial.
(ii) They flow swiftly over the plateaus and highlands.

38. Name a port on the east coast which is often hit by cyclones during the months of October and November.

Ans : COMP 2013

Chennai

39. Why is the Railways an important means of transport as compared to Airways ?

Ans : SQP 2017,2019

Railway is cheap mode of transportation. Railway can carry bulky raw material.

40. What was the first road from Peshawar to Kolkata known as ?

Ans : MAIN 2014

The first road from Peshawar to Kolkata was known as Grand Trunk Road (G.T. Road)

41. What is a National Highway ?

Ans : SQP 2015

The main roads which are constructed and maintained by the Central Government are known as National Highways.

42. Name the organization responsible for the development and maintenance of highways in India.

Ans : COMP 2016

The National Highways Authority of India (NHAI) is responsible for the development and maintenance of highways in India.

43. Why is road transport favoured in the northern plains of India?

Ans : MAIN 2017

Road transport is economical and well connected in this region. That's why the people of this region prefer road transport.

44. Name four cities which have Metro rail network.

Ans : COMP 2018

Cities like New Delhi, Kolkata, Chennai and Mumbai have their own metro networks.

45. What is an EMU ?

Ans : SQP 2019

Suburban trains that handle commuter traffic are mostly Electric Multiple units (EMUs). They usually have nine coaches or sometimes twelve to handle rush hour traffic.

46. How many zones do the Indian Railways have?

Ans : MAIN 2020

The Indian Railways have 17 zones.

47. Name a port on the east coast which is often hit by cyclones during the months of October and November.

Ans : COMP 2021

Chennai.

48. Name the two major projects developed by NHAI.

Ans : SQP 2022

The two major projects undertaken by NHAI:
(i) Golden quadrilateral.
(ii) North-South and East-West Corridors.

TWO MARKS QUESTIONS

49. Why is road transport an important means of transport in India? (Any two reasons)

Ans : MAIN 2024

Road transport an important means of transport in India due to following reasons :

1. Door-to-door connectivity : It provides direct access to remote areas, villages and urban centers, facilitating easy movement of people and goods.

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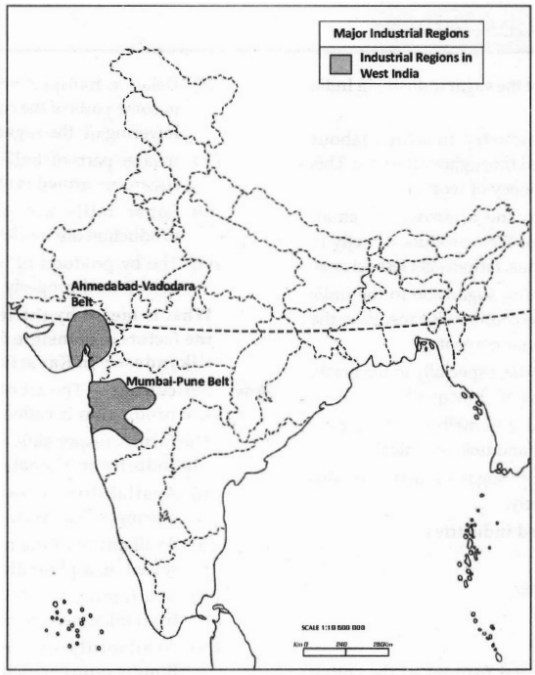
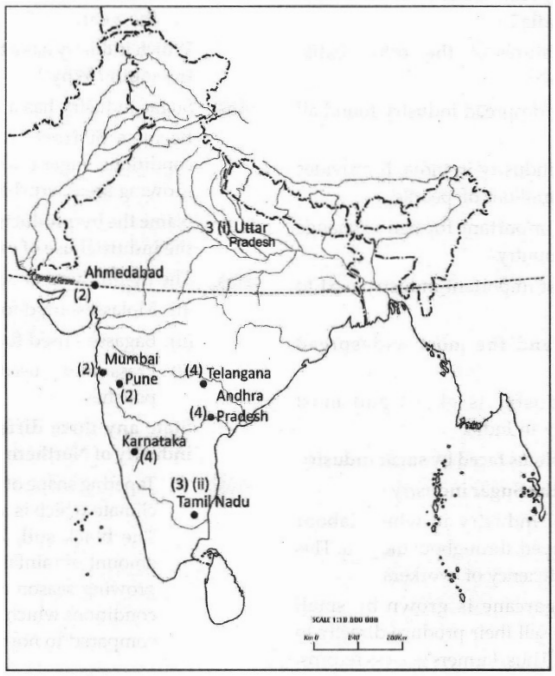
MAP BASED QUESTION

167. On the outline map of India mark the following :

1. The Industrial Region in West India.
2. The three largest Cotton Textile Industrial centres.
3. One centre of the Sugar Industry in (i) North India ; and (ii) Peninsular India.
4. Three states where sericulture is practised.

Ans : MAIN 2016





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16. The rivers of Peninsular India are not ideal for inland waterways because they are marked by number of_____.
(a) Estuaries
(b) Waterfalls
(c) Stones and silt on the river beds
(d) Tributaries

Ans : SQP 2014

Thus (b) is correct option.

17. Which of the following is an advantage of airways?
(a) Ease of crossing difficult terrain
(b) Dependencey on weather conditions
(c) Carriage of low tonnage
(d) Fuel used is petroleum

Ans : COMP 2015

Thus (a) is correct option.

18. Inland waterways are_____and_____.
(a) Expensive; inaccessible
(b) Cheap; environment friendly
(c) Cheap; carry low tonnage
(d) Cheap; easily cross barriers.

Ans : MAIN 2016

Thus (b) is correct option.

19. International Trade is between _____ countries.
(a) three
(b) six
(c) two
(d) four

Ans : SQP 2017

Thus (c) is correct option.

20. Imports are the products which_____in country.
(a) reside
(b) leave
(c) come
(d) non-resident

Ans : COMP 2018

Thus (c) is correct option.

21. A natural harbour on the west coast of India in the state of Kerala is_____.
(a) Thiruvananthapuram
(b) Mormugao
(c) Kandla
(d) Kochi

Ans : MAIN 2019

Thus (d) is correct option.

22. The port releases pressure on Mumbai port is_____.
(a) Kandla
(b) Mormugao
(c) Kochi
(d) Jawaharlal Nehru Port

Ans : SQP 2020

Thus (d) is correct option.

23. The deepest landlocked port is_____.
(a) Chennai
(b) Kochi
(c) Kandla
(d) Visakhapatnam

Ans : COMP 2022

Thus (d) is correct option.

24. The port on the east coast of India which exports iron ore and coal to Japan is_____.
(a) Haldia
(b) Chennai
(c) Visakhapatnam
(d) Paradip

Ans : MAIN 2023

Thus (d) is correct option.

25. This mode of transport can negotiate steeper slopes:
(a) Railways
(b) Airways
(c) Roads
(d) Waterways

Ans : MAIN 2000

Thus (c) is correct option.

26. India has the_____largest road network in the world.
(a) 4^{th} (b) 3^{rd}
(c) 10^{th} (d) 2^{nd}

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leading to frequent accidents and unsafe conditions.

2.2 Railways

Railways in India are a crucial means of transportation, playing a vital role in the economy by moving both passengers and freight. India's railways, which began in 1853 with a line from Mumbai to Thane, were nationalized in 1951 and now form the fourth largest and busiest network in the world, transporting over 18 million passengers and 2 million tonnes of freight daily. Stretching over 64,460 km and covering 683 stations, the system is managed by the Railway Board and divided into 17 zones.

Suburban rail networks in cities like Mumbai, Chennai and Delhi serve millions of commuters, while metro systems operate in cities such as New Delhi and Bengaluru. The Konkan railway is a separate, corporate entity under the Railway Ministry.

Railway Gauges :

1. Broad Gauge (1.676 m) : Widely used, connecting major cities.
2. Metre Gauge (1 m) : Found in parts of Uttar Pradesh, Bihar, Rajasthan and more.
3. Narrow Gauge (0.762 m) : Mainly used in mountainous regions like Shimla and Darjeeling.

Advantages of Railways :

1. Efficiently transports heavy and perishable goods.
2. Connects raw materials to production centers and markets.
3. Crucial during natural disasters for delivering aid.
4. Reduces travel time and connects rural areas to urban centers.
5. Integrates the country through an extensive network.

Disadvantages of Railways :

1. Difficult to lay tracks in hilly or forested areas.
2. Long journeys can be tiring compared to air travel.
3. Reliance on coal leads to pollution.
4. Cannot cross seas or unstable terrain.
5. Increased electricity use with electrified trains raises fares.
6. Lack of cleanliness and basic amenities.
7. Does not offer door-to-door service.

2.3 Airways

Air transport is the fastest and most comfortable mode of travel. The Airports Authority of India (AAI), established on April 1, 1995, manages the expansion and modernization of airports, ensuring safe and efficient air traffic services. In 2007, Air India and Indian Airlines merged under the name Air India, now the 16th largest airline in Asia. Private airlines like Jet Airways, SpiceJet, GoAir and Indigo also operate domestically and internationally.

Key airports in India include :

(i) Indira Gandhi International Airport, Delhi
(ii) Chhatrapati Shivaji International Airport, Mumbai
(iii) Netaji Subhash Chandra Bose International Airport, Kolkata
(iv) Chennai International Airport, Chennai

Pawan Hans Helicopters Ltd. (PHHL), established in 1985, provides helicopter services for offshore oil exploration and operates in remote, mountainous regions. It also supports state governments, North-Eastern states and tourism promotion.

Advantages of Airways :

1. Fastest transportation linking distant cities.
2. Capable of crossing mountains, deserts, seas and inaccessible areas.
3. Crucial during natural disasters, offering airlifts and supply drops.

Disadvantages of Airways :

1. Expensive compared to other modes of transport.
2. Weather-dependent, leading to delays in unfavorable conditions.
3. Reliant on non-renewable petroleum fuel.

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The chief industrial zones of India are as follows :
(i) The Western Industrial zone,
(ii) The North-Eastern Industrial zone,
(iii) The Northern Industrial zone,
(iv) The Southern Industrial zone and
(v) The Central Industrial zone.
The Western Industrial Zone is home to three key industries:
(i) The cotton textile industry in Mumbai and Ahmedabad.
(ii) The sugar industry in Maharashtra.
(iii) The chemical industry, primarily located in Mumbai, Maharashtra.

164. Give one factor responsible for each of following:
(i) Vishakhapatnam as a ship-building centre.
(ii) Bhopal as a heavy engineering centre.
(iii) Srinagar (Kashmir) as tourist centre.
(iv) Sindri as an important fertilizer centre.

Ans : MAIN 2015

(i) Visakhapatnam has all the necessary resources for shipbuilding, including steel, teak wood, aluminum, skilled labor and a deep navigable port. It is home to Hindustan Shipyard, the oldest shipbuilding facility in India.
(ii) Bhopal is a significant heavy engineering center supported by the presence of BHEL. As the capital of Madhya Pradesh, it has a high demand for heavy engineering goods and an abundant supply of raw materials like iron and steel for machinery production.
(iii) Srinagar (Kashmir) is a major tourist destination due to the breathtaking natural beauty of Kashmir. As the capital city of Kashmir, Srinagar offers all necessary accommodation and amenities for tourists.
(iv) Sindri is India's first fertilizer center, established in 1951. Located in the Jharia coalfield area of Jharkhand, Sindri utilizes thermal power from coal for fertilizer production.

165. Why is the iron and steel industry concentrated in the Chotanagpur region ? Which is the oldest and privately owned Steel plant ?

Ans : SQP 2016

This industry is concentrated in the Chotanagpur region due to the following factors :
(a) Availability of coal from the Damodar Valley.
(b) Access to iron ore from Singhbhum and nearby mines.
(c) Affordable hydro and thermal power from major multipurpose projects on the Damodar and Mahanadi rivers.
(d) Supply of cheap labor from the densely populated areas of Bihar, Odisha and West Bengal.
(e) Close proximity to the Kolkata market.
(f) Import and export of raw materials and finished goods are facilitated by Kolkata Port.
(g) Excellent communication links through rail and road networks to the Kolkata region.
The Tata Iron and Steel Company (TISCO) is the oldest privately owned steel plant in the region.

166. The following plants were set up with foreign collaboration. Name the foreign countries concerned :
(i) Bhilai
(ii) Rourkela
(iii) Visvesvaraya
(iv) Durgapur
(v) Bokaro

Ans : SQP 2017

The foreign countries associated with the iron and steel plants at the following locations are:
(i) Bhilai : Former Soviet Union
(ii) Rourkela : Germany
(iii) Peri and Marshall Co. : USA
(iv) Durgapur : Britain, Germany and the former Soviet Union
(v) Bokaro : Former Soviet Union, now the Russian Federation

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6. What percentage of road traffic is handled by the National Highways?
(a) 10 per cent
(b) 20 per cent
(c) 35 per cent
(d) 40 per cent

Ans : MAIN 2004

Thus (d) is correct option.

7. Which of the following is an important difference between a Highway and an Expressway?
(a) Presence of multiple roads on an Expressway.
(b) Controlled access through absence of multiple roads on an Expressway.
(c) Presence of large number of intersections on an Expressway.
(d) All of the above.

Ans : SQP 2005

Thus (b) is correct option.

8. The North South corridor connects
(a) Porbandar to Silchar
(b) Mumbai to Odisha
(c) Srinagar to Kanyakumari
(d) Lucknow to Ghazipur

Ans : COMP 2006

Thus (c) is correct option.

9. The two terminal points of East-West corridor are
(a) Porbandar and Silchar
(b) Mumbai and Dispur
(c) Ahmedabad and Imphal
(d) Surat and Gangtok

Ans : MAIN 2007

Thus (a) is correct option.

10. Which mode of transport allows farmers to move their perishable products quickly to the markets?
(a) Railways
(b) Airways
(c) Roadways
(d) Waterways

Ans : SQP 2008

Thus (c) is correct option.

11. The railways are divided into the basic operating units
(a) 20 routes
(b) 18 circles
(c) 20 zones
(d) 18 zones

Ans : COMP 2009

Thus (d) is correct option.

12. The railway track system is based on which of the following?
(a) Width of the track
(b) Length of the track
(c) Route of the track
(d) Load of the track

Ans : MAIN 2010

Thus (a) is correct option.

13. Which of the track is called the India gauge?
(a) Narrow Gauge
(b) Metre Gauge
(c) Broad Gauge
(d) All of the above

Ans : SQP 2011

Thus (c) is correct option.

14. The distance between rails in a metre gauge is
(a) 1.67 m
(b) 1 m
(c) 0.762 m
(d) 2 m

Ans : COMP 2012

Thus (b) is correct option.

15. Suburban trains that handle commuter traffic in cities are mostly_____.
(a) Diesel Multiple Units (DMUs)
(b) Coal Multiple Units (CMUs)
(c) Electric Multiple Units (EMUs)
(d) Solar Panel Units (SPUs)

Ans : MAIN 2013

Thus (c) is correct option.

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CHAPTER 12

TRANSPORT

SUMMARY

1. TRANSPORT

The transport system enables the movement of people and goods, essential for industrial and urban growth. In India, efficient transportation is crucial, with modes like roadways, railways, airways and waterways.

Importance:

1. Promotes unity among citizens.
2. Connects remote areas, reducing disparities.
3. Utilizes natural resources in remote regions.
4. Provides aid during crises.
5. Transports raw materials to industries.

2. MODES OF TRANSPORT

Different modes of transport are discussed below:

2.1 Roadway

India has a vast road network of around 33 lakh kilometers, the second-largest globally.

Road Types :

1. National Highways : Managed by the Central Government and NHAI, connecting the country. NH-7 is the longest, from Varanasi to Kanyakumari.
2. State Highways : Link state capitals to district headquarters, maintained by state PWD.
3. District Roads : Connect district headquarters with local areas, managed by Zila Parishad.
4. Rural Roads : Cover 80% of the network, linking villages to districts, crucial for agriculture.
5. Border Roads : Built by the BRO to serve border regions.
6. Golden Quadrilateral : A 5,846 km 4/6-lane highway connecting Delhi, Mumbai, Chennai and Kolkata, easing movement between cities.

Advantages of Roadways :

1. Ideal for transporting heavy and bulky materials.
2. Ideal for transporting heavy and bulky materials.
3. Connectivity : Links remote villages and hilly areas to towns and cities.
4. Cost-effective : Cheaper to build than railways.
5. Adaptability : Can be constructed on irregular land and hilly regions.
6. Door-to-door service : Reduces loading and unloading costs.
7. Security : Less risk of theft or pilferage during transportation.
8. Complementary : Connects railway stations and ports.
9. Efficiency : Allows farmers and producers to transport goods independently without relying on railways.

Disadvantages of Roadways :

1. Many roads are irregular, making them unsuitable for regular vehicular traffic.
2. Poorly maintained roads lead to heavy wear and tear on vehicles.
3. Numerous check posts and tolls slow vehicles, wasting time and frustrating passengers.
4. Indian roads often have weak pavements, unbridged crossings and lack proper amenities and safety measures.
5. Roads are overcrowded, especially in cities, with varied-speed vehicles,

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Ans : SQP 2002

Thus (d) is correct option.

27. These highways are maintained by the CPWD is:
(a) National Highways
(b) District Roads
(c) Border Security Roads
(d) Mountain Roads

Ans : COMP 2003

Thus (a) is correct option.

28. _____roads are maintained by the Zila Parishad.
(a) Highways
(b) District Roads
(c) Village Roads
(d) State Highways

Ans : MAIN 2004

Thus (b) is correct option.

29. The North-South Corridor connects the cities of_____.
(a) Silchar and Porbandar
(b) Delhi and Kolkata
(c) Pune and Bengaluru
(d) Srinagar and Kanyakumari

Ans : SQP 2005

Thus (d) is correct option.

30. _____highway is also known as Sher Shah Suri Marg.
(a) National Highway 1
(b) National Highway 2
(c) National Highway 3
(d) National Highway 6

Ans : COMP 2007

Thus (a) is correct option.

31. The Indian Railways consists of_____.
(a) four gauges
(b) three gauges
(c) two gauges
(d) eight gauges

Ans : MAIN 2008

Thus (b) is correct option.

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32. The international airport in Kolkata is called the_____.
(a) Indira Gandhi International Airport
(b) Netaji Subhash Chandra Bose International Airport
(c) Meenambakkam International Airport
(d) Chhatrapati Shivaji Maharaj International Airport

Ans : SQP 2009

Thus (b) is correct option.

33. The Kalka-Shimla line is confined to the _____.
(a) Narrow gauge
(b) Broad gauge
(c) Medium gauge
(d) Metre gauge

Ans : COMP 2010

Thus (a) is correct option.

34. This mode of transport is not of much use in hilly areas:
(a) Border roads
(b) Railways
(c) Highways
(d) State Roadways

Ans : MAIN 2011

Thus (b) is correct option.

35. This mode of transport connects remote areas which are difficult to access:
(a) Jet
(b) Aeroplanes
(c) Helicopter services
(d) Roads

Ans : SQP 2012

Thus (c) is correct option.

36. The National Waterways No. 2 is along the_____.
(a) River Ganga
(b) River Kaveri
(c) River Narmda
(d) River Brahmaputra

Ans : COMP 2013

Thus (d) is correct option.

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4. Faces stiff competition from foreign airlines.
5. High maintenance costs.
6. High freight charges.

2.4 Waterways

Water transport is the cheapest mode for moving heavy, bulky goods. India has a vast network of rivers, lakes, canals and a 7,517 km coastline, yet it contributes only 1% to India's total transport.

Water transport is divided into:

(i) Inland Waterways : Rivers, lakes and canals regulat----------
----
-ed by the Inland Waterways Authority of India (IWAI).

(ii) Oceanic Waterways : Supports 95% of India's foreign trade by volume and 70% by value.

(iii) Ports : Major cargo ports are managed by the Central Shipping Ministry, while minor ports are overseen by coastal states.

Advantages of Waterways:

1. Cheapest mode of transport.
2. Consumes less fuel and is eco-friendly.
3. Offers comfortable travel with ample space and amenities.
4. Less traffic compared to roads and railways.
5. Generates employment and promotes tourism.
6. Requires less capital investment due to no infrastructure costs.

Disadvantages of Waterways:

1. Poor connectivity between ports and hinterlands.
2. Dependent on weather conditions.
3. Long travel times can cause discomfort.
4. Many ports lack basic infrastructure.
5. Limited to navigable rivers and oceans.
6. Slow handling at ports causes delays and losses for shipping companies.

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MULTIPLE CHOICE QUESTION

1. Which of the following means of transport has best use during floods / earthquake?
(a) Airways
(b) Railways
(c) Roadways
(d) Waterways

Ans : MAIN 2024

Thus (a) is correct option.

2. The port in Eastern India which has the problem of silting is_____.
(a) Chennai
(b) Kolkata
(c) Puri
(d) Visakhapatnam

Ans : SQP 2024

Thus (b) is correct option.

3. India has the_____largest road network in the world.
(a) second
(b) third
(c) fourth
(d) sixth

Ans : MAIN 2001

Thus (a) is correct option.

4. _____are the backbone of road infrastructure in India.
(a) Border Roads
(b) Expressways
(c) National Highways
(d) State Highways

Ans : SQP 2002

Thus (c) is correct option.

5. Which of the following is the longest National Highway in India?
(a) NH 77
(b) NH 7
(c) NH 5
(d) NH 2

Ans : COMP 2003

Thus (b) is correct option.

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2. Flexibility and convenience : Road transport allows flexible travel schedules and short-distance travel, making it more convenient for daily commuting and transporting goods.

50. Give a reason for each of the following:
(i) Northern plain is best suited for the development of Railways.
(ii) Railways are managed completely by the Central Government.

Ans : MAIN 2024

(i) The Northern plain is best suited for the development of railways because the region has flat terrain, making it easier and more cost-effective to lay tracks and it has a dense population, generating high demand for passenger and freight transport.
(ii) Railways are managed completely by the Central Government because they form a national network, requiring uniform standards, policies and coordination across states for efficient and consistent operation across the country.

51. Name two situations where helicopter services may be used?

Ans : MAIN 2024

(i) Helicopter services can be used in inaccessible areas such as the interiors of Jammu and Kashmir and the mountainous regions of Himachal Pradesh, Uttarakhand and the northeastern states.
(ii) They also provide support to ONGC for offshore installations and are essential for defense operations or during natural disasters.

52. Why is it important to have a well developed means of transport in India?

Ans : MAIN 2023

Efficient transportation boosts trade, commerce and industry by facilitating the movement of goods and people, driving economic growth. It also enhances urban-rural connectivity, providing better access to markets, services and opportunities, fostering balanced regional development.

53. "Though an expensive mode of transport, Airways is gaining popularity in India." Explain giving two reasons.

Ans : MAIN 2023

(i) Airways provide faster travel, making them ideal for long distances and time-sensitive journeys, which is especially important in a large country like India.
(ii) They offer better connectivity to remote and inaccessible areas, such as the northeastern states and hilly regions, where other modes of transport are less feasible or slower.

54. Why are South Indian rivers not ideal for inland water transport?

Ans : MAIN 2023

South Indian rivers are not ideal for inland water transport because they are mostly seasonal and have an uneven flow, with many sections becoming dry or shallow during the non-monsoon periods. Additionally, they have a rocky terrain and fast currents, making navigation difficult.

55. Mention two advantages of waterways.

Ans : MAIN 2023

Advantages of waterways are:
1. Water transport is cheaper for moving bulk goods over long distances as it consumes less fuel compared to road or rail transport.
2. Waterways have a low environmental impact, producing less pollution compared to other forms of transport like trucks or trains.

56. Why are roadways considered more important than any other means of transport?

Ans : SQP 2023

Roads offer door-to-door service and are the most affordable and safest form of transportation, connecting villages to urban centers. They play a crucial role in the

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(v) It generates job opportunities in construction and increases demand for materials like cement and steel.

95. Give a geographical reason for each of the following :
(i) Railways bind the economic and cultural life of the country.
(ii) Railways are not common in North East India.
(iii) North India is better suited for railways and roadways.

Ans : COMP2020

(i) Railways play a crucial role in the economic and social development of the nation. The government is working to upgrade the railway system. Railways have brought villages closer to cities, facilitating the transfer of ideas and innovations to rural areas. They serve as an integrating force, connecting the country through an extensive network.
(ii) The rugged terrain and numerous rivers in North East India make railway construction costly and challenging.
(iii) Road and rail transport are preferred in northern India due to its flat plains, fertile soils and high population density, which make infrastructure development easier and more efficient.

96. Give two advantages and one disadvantage of helicopter services over aeroplane services.

Ans : MAIN 2021

Advantages of Helicopter :
(a) It is the fastest and most comfortable mode of transport, connecting remote and far-flung areas of the country.
(b) Helicopters are crucial during natural disasters, used to airlift people from affected areas and deliver food, medicines and other essentials.

Disadvantages of Helicopter : Air transport relies on petroleum, a non-renewable source of energy.

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97. List two advantages and one disadvantage of air transport in India.

Ans : SQP 2022

Advantages :
(i) It is the fastest mode of transport.
(ii) It is useful during natural calamities for rescue and relief operations.

Disadvantages :
(i) Air transport is expensive.
(ii) It is weather-dependent, with flights often delayed due to poor weather conditions.

98. What is the significance of an efficient transport system?

Ans : COMP 2023

(i) Transportation links backward areas with advanced regions, enabling better resource utilization.
(ii) It supports industrialization and urbanization by facilitating the movement of goods and labor.
(iii) Transportation alleviates scarcity during crises by enabling the distribution of essential goods.
(iv) It minimizes the impact of natural disasters by ensuring the quick delivery of aid and rescue operations.
(v) Transportation fosters cultural exchange and unity by promoting the movement of people, bringing diverse communities into contact.

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99. Give a geographical reason for each of the following.
(i) Nearly 70 per cent of Indians do not use air transport.
(ii) A well-developed transport network is important for industrial progress.
(iii) Airways are quite useful during natural calamity.

Ans : MAIN 2018

(i) Affordability Issues : India remains a developing nation with a significant portion of its population living below the poverty line, making air travel unaffordable for the average person. Consequently, airlines primarily cater to

It operates both domestic and international flights, serving as the country's flagship carrier.

66. Name the following :
(i) An important inland waterway of north east India.
(ii) One expressway with its terminal cities.
(iii) A major port which is not located on the sea coast and is at a distance of 128 km, from the coast along the banks of a river.

Ans : SQP 2000

(i) National Waterway No. 2 : Brahmaputra River between Sadiya and Dhubri (891 km)
(ii) The North-South Corridor, linking Srinagar and Kanyakumari
(iii) Kolkata Port

67. Give two reasons why peninsular rivers are not ideal for navigation.

Ans : COMP 2001

1. Seasonal flow fluctuations due to being rain-fed.
2. Rapids and waterfalls obstruct smooth navigation.

68. Give two advantages and two disadvantages of waterways.

Ans : MAIN 2003

(i) Advantages of waterways :
  (a) Cost-effective for bulk transport.
  (b) Environmentally friendly with low emissions.
(ii) Disadvantages of waterways :
  (a) Time-consuming for transit.
  (b) Limited to navigable routes only.

69. Name the types of roads used in India. Which agency is responsible for maintenance of each category separately?

Ans : SQP 2004

India has various types of roads, including National Highways, maintained by the National Highways Authority of India (NHAI); State Highways, managed by the State Public Works Departments (PWDs); District Roads, overseen by Zila Parishads; Rural Roads, maintained by Local Panchayats or schemes like the Pradhan Mantri Gram Sadak Yojana (PMGSY); Border Roads, handled by the Border Roads Organization (BRO); and Expressways, managed by the NHAI or specific expressway authorities.

70. Why is road transport in India considered more useful than rail transport ? Give reasons to support your answer.

Ans : COMP 2005

Road transport is considered more useful than rail transport because :
1. Door-to-door service : Provides direct delivery to destinations.
2. Flexibility : Can access remote areas and follow various routes.
3. Short distances : More efficient and economical for shorter trips.
4. Diverse vehicles : Supports multiple types of transport vehicles.

71. What is an Expressway ? Name one expressway.

Ans : MAIN 2006

Expressways are six-lane cemented roads, specifically designed to facilitate smooth, high-speed travel without any on-road obstacles such as traffic signals or speed breakers.
Example: Yamuna Expressway, connecting Greater Noida and Agra.

72. Give two points of difference between Highways and Expressways.

Ans : SQP 2007

Feature	Highway	Expressway
Definition	A paved road providing transportation for vehicles.	A four-lane divided highway with limited access.
Lanes	May have two or four lanes, divided or undivided.	Normally four lanes, divided.

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economic development of the country and also serve as links between railway stations and ports.

57. Mention two advantages of using railways as means of transport.

Ans : MAIN 2023

Two advantages of using railways as means of transport :

1. Railways act as the primary and more economical mode of transportation for both goods and passengers.
2. Railways foster integration across regions, for example, connecting the eastern states with the west and the northern states with the south.

58. Mention one advantage and one disadvantage each of inland waterway.

Ans : SQP 2014

(i) Advantage of Inland Waterways : It is a cost-effective way to transport heavy and bulky goods over long distances with minimal fuel consumption.

(ii) Disadvantage of Inland Waterways : Navigation is dependent on water levels, which can fluctuate due to weather conditions, making it unreliable at times.

59. State any three disadvantages of railway.

Ans : MAIN 2019

1. High construction and maintenance costs.
2. No door-to-door service, requiring additional transport.
3. Limited access in hilly and remote areas.

60. Mention two advantages and one disadvantage of air transport.

Ans : COMP 2013

Advantages of Air Transport :

1. Fastest mode of transport, ideal for long-distance travel.
2. Efficient during emergencies, like natural disasters and medical evacuations.

Disadvantage of Air Transport : High cost, making it less affordable compared to other modes of transport.

61. Air transport has gained popularity in recent time in India. Give reason.

Ans : SQP 2013,2018

Air transport has gained popularity in India due to its speed and efficiency, making it ideal for long-distance travel, especially with the country's vast size. Additionally, the expansion of low-cost airlines and improved connectivity between major cities and remote areas has made air travel more accessible and convenient for people.

62. State one economic benefit of the Golden Quadrilateral Project.

Ans : COMP 2015

It enhances trade and commerce by improving connectivity between major industrial, agricultural and cultural hubs, reducing transportation time and costs.

63. NSEW is helpful for India. Give reasons.

Ans : MAIN 2022

NSEW is helpful for India because:

1. Improves national connectivity by linking key regions.
2. Promotes balanced regional development by reducing disparities.

64. Roadways are always considered more important than any other means of transportation. Give two reasons in support of the statement.

Ans : MAIN 2016,2019,2022

1. Constructing roads necessitates a smaller capital outlay compared to building railway systems.
2. Roads can be developed at elevated altitudes and across a variety of terrains, allowing for greater flexibility in placement.
3. The expenses associated with maintaining road networks are comparatively minimal.

65. What is the name of the National Airlines of India?

Ans : MAIN 2023

The National Airline of India is Air India.

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THREE MARKS QUESTIONS

80. Mention two advantages and one disadvantage of Inland water transport.

Ans : MAIN 2024

(i) Advantages :
1. Low operating cost : It is a cost-effective mode for transporting large and heavy goods over long distances.
2. Environmentally friendly : Inland water transport causes less air pollution and has a minimal carbon footprint compared to road and rail transport.

(ii) Disadvantage : It is slower than other modes of transport like road or rail, making it less suitable for transporting time-sensitive goods.

81. Why has airway become more popular than other means of transport? (Any three reasons)

Ans : MAIN 2024

Airway become more popular than other means of transport due to following reasons :
1. Speed : Air travel is the fastest mode of transportation, making it ideal for long-distance and time-sensitive travel.
2. Accessibility to remote areas : Airways provide connectivity to difficult-to-reach regions, such as hilly terrains and islands, where other transport options are limited.
3. Comfort and convenience : Air travel offers higher comfort levels and shorter travel times, making it a preferred choice for passengers, especially over long distances.

82. (i) Which is the principal mode of transportation for freight and passengers?
(ii) Mention any three problems of that means of transport.

Ans : SQP 2012

(i) Railways are the principal mode of transportation for both freight and passengers.

(ii) Three problems of that means of transport:
(a) High maintenance costs for tracks, stations and equipment.
(b) Overcrowding in passenger trains, especially during peak hours.
(c) Limited reach in remote and hilly areas, making accessibility difficult.

83. (i) Which is the cheapest means of transport?
(ii) Mention any three advantages and disadvantages of that means of transport.

Ans : COMP 2016,2019,2017

(i) Waterways are the cheapest means of transport.

(ii) (a) Three advantages of waterways:
1. Cost-effective for transporting heavy and bulky goods.
2. Environmentally friendly, with low fuel consumption.
3. Low infrastructure cost as waterways require no construction like roads or railways.

(b) Three disadvantages of waterways :
1. Slow speed, making it unsuitable for urgent transport.
2. Weather-dependent, with services often affected by adverse conditions.
3. Limited to navigable areas, restricting access to certain regions.

84. (i) Name any three agencies which are responsible for the construction and maintenance of roads in India.
(ii) What are the advantages of roads over the railways ?

Ans : MAIN 2014,2018

(i) (a) National Highways Authority of India (NHAI).
(b) State Public Works Department (PWD).
(c) Border Roads Organisation (BRO).

(ii) Advantages of roads over railways :
(a) Door-to-door service : Roads provide direct connectivity to homes, offices and industries.
(b) Flexibility : Roads are suitable for short and long distances and can reach

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5. Employment : It generates significant employment in the aviation sector.
6. Tourism Boost : It supports tourism by offering affordable travel options.

103. Give two points of difference between Inland Waterways and Oceanic Waterways.

Ans : MAIN 2005

Feature	**Inland Waterways**	**Oceanic Waterways**
Definition	Inland waterways refer to rivers, canals and lakes used for navigation within a country.	Oceanic waterways involve transportation through seas and oceans, connecting different countries and continents.
Usage	Mainly used for transporting goods and people over short to medium distances within the country.	Used for long-distance international trade and connecting major global ports.

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90. Transport is the backbone of a country's economy. Give reasons to support your answer

Ans : MAIN 2015

Transport is the backbone of a country's economy because:

1. Facilitates trade : It enables the movement of goods and services, boosting economic activity.
2. Improves connectivity : Links remote areas to urban centers, providing access to essential services and jobs.
3. Supports industries : Ensures timely delivery of raw materials and products, promoting efficiency.
4. Boosts tourism : A good transport network attracts tourists, contributing to the economy.
5. Creates jobs : The transport sector generates employment for millions.

91. Give two points of difference between a Port and a Harbour

Ans : SQP 2016

The difference between a Port and Harbour are as follows :

Port	Harbour
Ports are man-made commercial places built along the coastline.	Harbours are natural or created places, connecting a piece of land with a large waterbody, which serve as ports.
The location of ports is chosen along the coastline where water is navigable and is close to land facilities and infrastructure.	Natural harbours are surrounded by land on most sides but have an entrance point to the sea.
The main purpose of ports is loading and unloading of cargo ships.	Harbours are utilised mainly for providing safe parking or anchorage to ships.

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92. Give two advantages and one disadvantages of railways.

Ans : COMP 2017

(i) Advantages of Railways:
  (a) Railways enable the efficient transportation of bulky goods and perishable commodities over long distances.
  (b) Railways help move raw materials to production units and distribute finished goods to markets.

(ii) Disadvantages of Railways:
  (a) Rail transport lacks route flexibility, as tracks cannot be easily laid in hilly or remote forested areas.
  (b) Train travel can be lengthy and exhausting, especially when compared to the speed of air travel.

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93. Mention any three problems being faced by the Indian Railways.

Ans : MAIN 2018

Problems faced by the Indian Railways are :

(i) Trains do not offer door-to-door service, requiring passengers and goods to depend on road transport to reach their final destinations.

(ii) Outdated trains, tracks and equipment pose safety risks for railway operations.

(iii) Electrification of railways has led to significant power consumption and increased tariff rates.

94. Give three economic benefits of the Golden Quadrilateral Project.

Ans : SQP 2019

The main economic benefits of the Golden Quadrilateral Project are :

(i) It interconnects major cities and ports across the country.

(ii) It boosts truck transport throughout India.

(iii) It promotes industrial growth in small towns along its route.

(iv) It facilitates the transport of agricultural produce from the hinterland to cities and ports for export.

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73. What are National Highways?

Ans : COMP 2008

The primary roads built and maintained by the Central Government are referred to as National Highways. These highways span the entire country, connecting key ports, state capitals, major industrial hubs and tourist destinations. They play a crucial role in facilitating inter-state transportation and the movement of defense personnel and materials in strategic regions. In India, National Highways are labeled as NH followed by their respective numbers.

74. What is the Golden Quadrilateral Project ?

Ans : MAIN 2009

The Golden Quadrilateral (GQ) stands as India's most extensive express highway initiative. It marks the initial phase of the National Highways Development Project (NHDP) and involves constructing 5,846 kilometers of four- and six-lane expressways that link Delhi, Mumbai, Kolkata and Chennai, effectively creating a quadrilateral shape. The project is undertaken with an investment of ₹60,000 crores. In January 2008, it was announced that the scope of the project would be expanded to encompass 6,500 kilometers.

75. How is the Indian rail network one of the largest and busiest networks in the world ?

Ans : SQP 2010

In 1947, the year India gained independence, there were forty-two separate rail systems. By 1951, these systems were nationalized and unified into a single entity, forming one of the largest rail networks in the world. Indian Railways now operates both long-distance and suburban rail services across the country.

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76. Name the regulatory body looking after air transport in India. State any two of its functions.

Ans : COMP 2011

The Directorate General of Civil Aviation (DGCA) is the regulatory body responsible for overseeing air transport in India.

Safety Regulation and Oversight: Develops and enforces safety standards for airlines, airports and aviation personnel to ensure compliance with national and international regulations.

Licensing and Certification: Issues licenses to pilots, engineers and air traffic controllers and certifies aircraft and aviation organizations to meet operational and safety requirements.

77. Explain the role of oceanic waterways in the transport sector of India's economy.

Ans : MAIN 2012

Oceanic waterways play a significant role in India's transport sector. They manage 95% of India's foreign trade by volume and 70% by value. In addition to international trade, these routes are also utilized for transportation between the country's mainland and its islands.

78. What are the two prerequisites of waterways to be navigable ?

Ans : SQP 2013

(i) Inland waterways, including rivers, canals, backwaters and creeks, must have sufficient depth to ensure safe navigation for ships and boats.

(ii) These waterways should also be clear of obstacles like waterfalls and rapids.

79. On which river and between which two places does the National Waterway No. 2 lie ?

Ans : COMP 2014

National Waterway No. 2 lies on the Brahmaputra River and it stretches between Sadiya and Dhubri in the state of Assam.

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a niche market segment that can afford the high ticket prices.

(ii) Economic Connectivity : Air transport plays a vital role in linking various regions of the country, facilitating the transportation of raw materials, fuel and machinery to production centers. Additionally, it enables the distribution of finished products to markets and consumer hubs, thereby supporting industrial growth.

(iii) Disaster Response : Air transport is crucial during natural disasters, as it allows for the evacuation of people from impacted areas and the delivery of essential supplies such as food, medicine and other necessary items to those affected by calamities.

100. Give a geographical reason for each of the following :

(i) The Ganga is navigable from its mouth right upto Allahabad.

(ii) The Peninsular rivers are not ideal for inland water transport.

(iii) Mumbai is a harbour and a port.

Ans : MAIN 2002

(i) The Ganga originates from the Gangotri glacier in the Great Himalayas. As it traverses the northern plains, numerous tributaries merge into it. The Yamuna, a significant right-bank tributary, joins the Ganga at Allahabad, making the river navigable from its mouth all the way up to Allahabad.

(ii) Peninsular rivers are characterized by multiple waterfalls, which are harnessed for generating hydroelectric power. Additionally, these rivers have been dammed for irrigation and electricity production. Consequently, they are not suitable for navigation.

(iii) When natural harbours are equipped with comprehensive port facilities, they operate effectively as ports. For instance, Mumbai is a natural harbour that also serves as the largest port in India.

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101. Explain why India has an extensive network of waterways.

Ans : SQP 2003

India has an extensive network of waterways due to several geographical and economic factors :

1. Vast River System: India is home to many large rivers like the Ganges, Brahmaputra, Godavari and Krishna, which provide natural waterways for transportation across large distances.
2. Long Coastline: With a coastline of over 7,500 kilometers, India is well-suited for coastal shipping, facilitating transport and trade between coastal cities and neighboring countries.
3. Economic Efficiency: Waterways are a cost-effective mode of transport for bulk goods like coal, iron ore and agricultural products, reducing transportation costs compared to road and rail transport.
4. Connectivity: Inland waterways help connect remote areas, especially in the northeastern region and riverine states, where other forms of transportation may be difficult to establish due to challenging terrain.

102. Discuss the contribution of Air India in the air transport of India

Ans : COMP 2004

Air India has contributed to India's air transport in these key ways :

1. National Carrier : As the flag carrier, it connects India to major global destinations, enhancing its presence in international aviation.
2. Extensive Network : Air India provides domestic and international connectivity, linking remote areas to major cities and promoting tourism.
3. Global Reach : It was the first Indian airline to offer international flights, aiding business, tourism and cultural exchange.
4. Crisis Response : Air India plays a key role in rescue and evacuation missions during crises, like the Vande Bharat Mission.

areas where railways are unavailable.
(c) Lower construction cost : Roads are cheaper and easier to build compared to railway tracks.

85. Why are the means of transport called the lifelines of a nation and its economy ?

Ans : COMP 2018

Means of transport are called the lifelines of a nation and its economy because they connect different regions, facilitate the movement of goods and people and enable trade, commerce and industrial development. Transport ensures the efficient distribution of essential resources and services across the country, promoting economic growth and integration.

86. A well developed transport not network is important for industrial growth. Give reason.

Ans : MAIN 2019

1. Efficient supply of raw materials, reducing production delays.
2. Easier access to markets for distributing finished goods.
3. Lower logistics costs, boosting industrial competitiveness.

87. (i) Why is the railways so important today ?
(ii) Name any two centres which produce rolling stock for Indian railways.

Ans : SQP 2018

(i) Railways so important today due to following reasons :
(a) Indian Railways handle the majority of long-distance passenger traffic and transport 80% of the country's total freight.
(b) The iron and steel industry relies heavily on railways to move raw materials and finished goods across various locations.
(c) Indian Railways is a major employer, providing jobs to a large number of people across the nation.
(d) Railways contribute to national integration by connecting people from different regions and fostering unity.

(ii) Varanasi and Kapurthala.

88. (i) Name the National Waterways of India.
(ii) State one advantage of inland waterways.

Ans : MAIN 2018

(i) The government has declared the following waterways as the National Waterways :
(a) National Waterway 1 (NW-1): Allahabad to Haldia (Ganga-Bhagirathi-Hooghly river system)
(b) National Waterway 2 (NW-2): Sadiya to Dhubri (Brahmaputra River)
(c) National Waterway 3 (NW-3): Kollam to Kottapuram (West Coast Canal)
(d) National Waterway 4 (NW-4) : Kakinada to Puducherry
(e) National Waterway 5 (NW-5) : Brahmani River and East Coast Canal.

(ii) Advantages of inland waterways :
(a) Ideal for transporting heavy and bulky goods.
(b) Fuel-efficient and environmentally friendly mode of transport.
(c) Experiences minimal wear and tear compared to other transport modes.
(d) Over 95% of the country's trade volume is carried by sea routes.

89. Give a reason for each of the following:
(i) Nearly seventy percent of Indians do not use air transport.
(ii) A well-developed transport network is important for industrial growth.
(iii) Water transport is not as popular as land transport in India.

Ans : SQP 2019

(i) Because it is expensive compared to other modes of transport, making it less accessible for the majority of the population.
(ii) It enables efficient movement of raw materials to factories and finished products to markets, reducing costs and increasing productivity.
(iii) Water transport is much slower than road, rail, or air transport and provides limited area access.

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CHAPTER 13

WASTE MANAGEMENT

SUMMARY

1. WASTE MATERIAL

Waste materials refer to substances rejected after use in any activity. These include waste generated by natural vegetation, animals, insects and humans, which can be recycled back into the environment.

According to the Environment Protection Act, 1990:

(i) Waste is any discarded material, effluent, or unwanted residue from an activity.

(ii) It includes items that need disposal due to being broken, worn out, contaminated, or spoiled.

1.1 Classification of Waste

Wastes are categorized as:

(i) Biodegradable : Items like vegetable peels and paper that decompose naturally.

(ii) Non-biodegradable : Materials like plastic and glass that cannot decompose.

(iii) Toxic : Hazardous wastes such as industrial effluents and medical waste.

1.2 Waste Sources

(i) Industrial: Chemical gases, liquids and solids.

(ii) Agricultural: Plant and animal waste.

(iii) Domestic: Food waste, plastics.

(iv) Biomedical: Expired drugs, syringes.

(v) Nuclear: Radioactive materials.

2. POLLUTION

Pollution refers to the harmful addition of substances to the environment, mainly due to human activities. The substances causing pollution are called pollutants. Types of Pollution :

2.1 Air Pollution

Occurs when harmful chemicals or particulates are released into the air, damaging the ecosystem.

2.2 Water Pollution

Results from harmful chemicals and waste entering water bodies, altering their quality. Contaminated water can cause diseases like diarrhea and typhoid.

2.3 Soil Pollution

Caused by the addition of solid and semi-solid wastes from agriculture, industry and households. Common pollutants include petroleum, heavy metals and pesticides.

3. IMPACT OF WASTE

Waste accumulation in urban areas spoils landscapes, causes foul odors, spreads diseases and leads to soil and water pollution.

3.1 Impact of Waste Accumulation

(i) **Health Issues :** Indiscriminate dumping leads to serious health risks, like outbreaks of diseases. Pollutants like carbon monoxide reduce oxygen in the blood, while CO_2 contributes to global warming.

(ii) **Pollutants :** Chemicals like CFCs damage the ozone layer and lead causes nervous system damage. Sulfur dioxide leads to smog and acid rain and plastic waste releases harmful toxins.

(iii) **Waste Sites :** Dumping grounds become breeding areas for disease-carrying pests. Recycling toxic materials can expose workers to hazardous chemicals.

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Ans : MAIN 2004

Thus (c) is correct option.

7. The increase in the number of phytoplanktons and algae reduce the penetration of _____, light and heat into water body.
(a) Small fish
(b) Nitrogen
(c) Oxygen
(d) Carbon dioxide

Ans : SQP 2005

Thus (c) is correct option.

8. Domestic waste being organic in nature undergoes _____ and create conditions favourable for the growth of pathogens.
(a) Fermentation
(b) Nitrification
(c) Magnification
(d) Oxygenation

Ans : COMP 2006

Thus (a) is correct option.

9. _____is a harmful toxin that affects the development of a child's brain.
(a) Lead
(b) Mercury
(c) Cadmium
(d) Zinc

Ans : MAIN 2007

Thus (a) is correct option.

10. _____ is a chemical that is said to cause cancer.
(a) Arsenic
(b) Cadmium
(c) Calcium
(d) Lead

Ans : SQP 2008

Thus (a) is correct option.

11. The increase in the concentration of various toxic substances along the food chain is called
(a) Eutrophication
(b) Bio-accumulation
(c) Biomagnification
(d) Demagnification

Ans : COMP 2009

Thus (c) is correct option.

12. The phenomenon of concentrated toxic deposition at the higher trophic level is known as _____.
(a) Bio-accumulation
(b) Biomagnification
(c) Eutrophication
(d) Biodegradation

Ans : MAIN 2010

Thus (b) is correct option.

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13. The accumulation of toxins will be higher in which of the following?
(a) Water
(b) Algae
(c) Small fish
(d) Big fish

Ans : SQP 2011

Thus (d) is correct option.

14. Waste accumulation is a breeding ground for _____ like flies, mosquitoes, rodents and pet animals.
(a) Hectors
(b) Vectors
(c) Spreaders
(d) Carriers

Ans : COMP 2012

Thus (b) is correct option.

15. Which of the following diseases are Not spread by houseflies?
(a) Typhoid
(b) Diarrhoea
(c) Cholera
(d) Amoebiosis

Ans : MAIN 2013

Thus (d) is correct option.

16. The warming up of the atmosphere due to the increased concentration of Greenhouse Gases is known as _____.
(a) Global Warming
(b) Climate change
(c) Acid rain
(d) Radiation

5. Repairing items instead of replacing them.
6. Using washable table napkins instead of paper ones.

5.2 Reusing Waste

Items can be repurposed before disposal:

1. Returning packaging materials for reuse.
2. Furnishing offices with reclaimed materials.
3. Reusing electronics like computers and printers.
4. Shopping for second-hand items like furniture and clothes.
5. Using fly ash in construction to replace cement.

5.3 Recycling Waste

Recycling involves processing waste into new products, saving energy and reducing pollution:

1. Recycling prevents air, land and water pollution.
2. Conserves natural resources by reducing reliance on raw materials.
3. Saves energy as recycling requires less energy than producing new items.
4. Creates jobs in waste collection and recycling centers.

Methods of Waste Recycling :

(i) Paper Recycling: Waste paper is processed into new paper.
(ii) Plastic Recycling: Scrap plastics are turned into new products, e.g., plastic bottles into chairs.
(iii) Car Recycling: Old cars are dismantled and their parts and metals are reused.

MULTIPLE CHOICE QUESTION

1. Which of the following is a biodegradable waste?
(a) Broken glass
(b) Wastepaper
(c) Polythene
(d) Plastic bags

Ans : MAIN 2024

Thus (b) is correct option.

2. Which of the following method of waste disposal is harmful?
(a) Composting
(b) Segregation
(c) Dumping
(d) Vermicomposting

Ans : MAIN 2023

Thus (c) is correct option.

3. Any material that is discarded after it has served its purpose and is no longer useful is called_____.
(a) Compost
(b) Waste
(c) Manure
(d) Pathogen

Ans : MAIN 2000

Thus (b) is correct option.

4. Any material that is rendered useless during or left over in a manufacturing process is called_____.
(a) Industrial waste
(b) Domestic waste
(c) Commercial waste
(d) Mining waste

Ans : SQP 2001

Thus (a) is correct option.

5. Which of the following is NOT a toxic substances present in e-waste?
(a) Cadmium
(b) Lead
(c) Mercury
(d) Methane

Ans : COMP 2003

Thus (d) is correct option.

6. The process of depletion of oxygen from water bodies occurring either naturally or due to human activities is called _____.
(a) Biomagnification
(b) Oxygenation
(c) Eutrophication
(d) Acid rain

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3.2 Impact on Terrestrial Life

Toxic waste pollutes soil, water and air, affecting plants, animals and humans. Contaminants like heavy metals accumulate in the food chain, causing long-term health risks. Domestic animals often ingest plastic, leading to health complications.

3.3 Impact on Aquatic Life

Waste disposal in rivers and lakes reduces oxygen levels, threatening aquatic life, including fish. Sewage contamination introduces harmful bacteria and pollutants like heavy metals accumulate in organisms, impacting human and animal health.

3.4 Impact on Marine Life

Oceans, used as dumpsites, face pollution from oil spills and toxic chemicals like herbicides and pesticides. Mangrove forests and coastal ecosystems are harmed, while radioactive waste disturbs marine life breeding.

4. WASTE MANAGEMENT

Rapid urbanization and industrialization have worsened pollution. Waste management is essential to prevent environmental and health hazards, including air quality deterioration, acid rain, plastic pollution and the blocking of drainage systems. Solutions include recycling, stricter pollution laws and eco-friendly technologies.

4.1 Steps for Waste Management

(i) Control population growth.
(ii) Develop infrastructure for waste disposal.
(iii) Implement stricter laws against polluting.
(iv) Educate farmers on pesticide dangers.
(v) Promote cleaner technologies and auto fuel.
(vi) Raise awareness and action plans for polluted areas.

4.2 Safe Disposal of Waste

Waste should be disposed of according to its type, such as solid, liquid, organic, inorganic, toxic, or non-toxic. The main methods are:

(i) **Segregation of Waste :** Dividing waste into categories like "reduce," "reuse," and "recycle." Biomedical and industrial waste should not mix with biodegradable waste. Proper segregation prevents contamination of groundwater by hazardous chemicals.

(ii) **Open Dumping :** Uncovered areas used for dumping untreated, unsegregated waste. Open dumps breed pests and contaminate water, land and air. Landfills are used instead, where waste is covered daily to reduce health risks. However, landfills can cause groundwater contamination and methane release.

(iii) **Composting :** A biological process where organic waste like leaves and fruit peels is decomposed by fungi and bacteria. This produces compost, which enriches soil and biogas. Composting can be aerobic (with oxygen) or anaerobic (without oxygen).

Benefits of Composting:

(i) Improves soil resistance to drought and diseases.
(ii) Enhances crop nutrient absorption.
(iii) Enriches poor soil with humus.
(iv) Reduces soil erosion.
(v) Cost-effective for farming by reducing the need for water, fertilizers and pesticides.

5. NEED FOR REDUCING, REUSING AND RECYCLING WASTE

In developing countries, waste management is becoming a major issue. Governments and local bodies are seeking sustainable ways to manage waste and reduce its environmental impact. Waste management can be done in three key ways:

5.1 Reducing Waste

People can control waste generation through:

1. Avoiding non-biodegradable items like polythene bags and using cloth or paper bags.
2. Using eco-friendly solar products.
3. Reducing household waste by composting vegetable peels, papers and leftovers.
4. Reusing plastic disposables instead of discarding them immediately.

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Ans : SQP 2014

Thus (a) is correct option.

17. Hepatitis, diarrhoea and corona are_____ diseases.
(a) Bacterial
(b) Viral
(c) Fungal
(d) None of the above.

Ans : COMP 2015

Thus (b) is correct option.

18. Dry waste consists of waste that is_____.
(a) Biodegradable
(b) Non-biodegradable
(c) Non-toxic
(d) Organic

Ans : MAIN 2016

Thus (b) is correct option.

19. Wet waste is the waste that is_____in nature.
(a) Non-biodegradable
(b) Organic
(c) Recyclable
(d) Toxic

Ans : SQP 2017

Thus (b) is correct option.

20. _____of waste is the key to effective waste management.
(a) Segregation
(b) Modification
(c) Solidification
(d) Nitrification

Ans : COMP 2018

Thus (a) is correct option.

21. Biodegradable waste can be converted into _____.
(a) Soil
(b) Humus
(c) Rubber
(d) Compost

Ans : MAIN 2019

Thus (d) is correct option.

22. _____ is the cheapest method of waste disposal.
(a) Open dumping
(b) Sanitary landfill
(c) Recycling
(d) Incineration

Ans : SQP 2020

Thus (b) is correct option.

23. _____ is a way of disposing waste on land without causing health hazards or public safety.
(a) Dumping
(b) Sanitary landfill
(c) Recycling
(d) Incineration

Ans : COMP 2021

Thus (b) is correct option.

24. _____ is an aerobic method of decomposing solid wastes.
(a) Incineration
(b) Recycling
(c) Compositing
(d) Dumping

Ans : MAIN 2022

Thus (c) is correct option.

25. The organic waste from households undergo _____ to form compost.
(a) Reduction
(b) Burning
(c) Decomposition
(d) Churning

Ans : SQP 2023

Thus (c) is correct option.

26. Compositing rejuvenates poor soils by adding
(a) Nutrients
(b) Manure
(c) Humus
(d) Oxygen

Ans : COMP 2021

Thus (c) is correct option.

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Ans : MAIN.2024

(i) The waste management method depicted here is segregation of waste, where different colored bins are used for sorting different types of waste (e.g., recyclable, non-recyclable, organic and hazardous waste).

(ii) This method can be implemented at home by using separate bins for organic waste (kitchen scraps), recyclable materials (plastics, paper) and non-recyclable waste, ensuring proper disposal and reducing the burden on landfills.

57. Explain how waste accumulation can be harmful. (Any two points)

Ans : MAIN 2024

Waste accumulation can be harmful in the following ways :

(i) Environmental Pollution : Accumulated waste can lead to air, water and soil pollution, releasing harmful chemicals and toxins into the environment, which can affect human health and biodiversity.

(ii) Health Hazards : Piles of untreated waste attract pests like rodents and insects, leading to the spread of diseases and creating unhygienic living conditions.

58. Give two uses of composting.

Ans : MAIN 2024

Two uses of composting are :

(i) Soil enrichment : Compost improves soil structure and provides essential nutrients, enhancing plant growth.

(ii) Waste reduction : Composting reduces the amount of organic waste sent to landfills, helping to manage waste effectively.

59. Why are landfills set up far away from the city? (Any two reasons)

Ans : MAIN 2024

Two reasons why landfills are set up far away from the city :

(i) To minimize health risks : Landfills emit harmful gases and can contaminate water and air, so they are kept away from populated areas to reduce health hazards.

(ii) To avoid environmental pollution : Setting up landfills far from the city helps prevent unpleasant odors, pests and pollution in residential and commercial areas.

60. Why should Waste Management be practiced in every school?

Ans : MAIN 2023

Waste Management should be practiced in every school due to following reasons :

(i) Environmental responsibility : It teaches students the importance of reducing waste, recycling and protecting the environment, fostering eco-friendly habits from a young age.

(ii) Clean and healthy surroundings : Proper waste disposal helps maintain a clean and healthy school environment, reducing the risk of pollution and health hazards.

61. Mention one advantage and one disadvantage of dumping of waste.

Ans : MAIN 2023

Advantage and disadvantage of dumping of waste:

(i) Advantage : Dumping of waste is a cost-effective and easy method for disposing of large quantities of waste, especially in areas with abundant land.

(ii) Disadvantage : It can lead to environmental pollution, such as soil and groundwater contamination and contributes to harmful emissions like methane, which accelerates climate change.

62. How is recycling of waste helpful? Give an example of recycling of waste.

Ans : MAIN 2023

Recycling of waste is helpful because it reduces the consumption of new raw materials, conserves energy and minimizes environmental pollution. An example of recycling is converting used paper into new paper products.

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42. What is open dumping of wastes ?

Ans : COMP 2008

In this method waste materials are dumped in open low lands far away from the city.

43. What type of impurities are removed from water by flocculation ?

Ans : MAIN 2009

By flocculation turbidity as well as many suspended bacteria in the water are removed.

44. Name a coagulant added to water for flocculation.

Ans : SQP 2010

Aluminium Sulphate or alum.

45. Give an example of reusing the waste effectively.

Ans : COMP 2011

Some solid wastes from the industry can be utilized directly. Fly-ash from power plants is used as a cement substitute.

46. Name two useful products which can be made from biodegradable domestic waste.

Ans : MAIN 2012

Compost or Gobar gas.

47. Mention the types of waste on the basis of decomposition.

Ans : SQP 2013

Biodegradable and Non-biodegradable

48. Name the gases contributing potentially to Global Warming and Climate Change phenomenon.

Ans : COMP 2014

Carbon dioxide and methane.

49. Mention any four sources of industrial waste.

Ans : MAIN 2015

Chemical units, thermal power plants, petrochemical plants and oil refineries.

50. Name the diseases leads by polluted air.

Ans : SQP 2016

Asthma, bronchitis, emphysema and lung cancer.

51. Mention any two harmful gases.

Ans : MAIN 2017

Carbon monoxide and hydrogen sulphide

52. Name the gases released in the process of mining.

Ans : COMP 2018

Methane and carbon monoxide.

53. What is oil spilling ?

Ans : MAIN 2019

Release of liquid petroleum/mineral oil into the environment is called oil spilling.

54. Which is the most serious pollutant in the air ?

Ans : SQP 2020

Sulphur dioxide.

55. Mention any four sources of oil pollution.

Ans : COMP 2021

Oil spill, garbage dumping, accumulation of toxic materials and industrial waste.

TWO MARKS QUESTIONS

56. With reference to the picture below, answer the questions that follow:

(i) Which waste management method is depicted here?
(ii) State one way in which this method may be implemented at our home.

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27. _____process is used for waste disposal by industries and municipalities.
(a) Compositing
(b) Dumping
(c) Incineration
(d) Segregation

Ans : MAIN 2000

Thus (c) is correct option.

28. Waste can be effectively managed by using three _____ of waste management.
(a) S's
(b) R's
(c) C's
(d) M's

Ans : SQP 2001

Thus (b) is correct option.

29. Which of the following is Not included in three R's of waste management?
(a) Reduce
(b) Reuse
(c) Recycle
(d) Regenerate

Ans : COMP 2002

Thus (d) is correct option.

ONE MARK QUESTIONS

30. Name two common diseases caused as a result of gaseous pollution.

Ans : MAIN 2013

Asthma and bronchitis.

31. Mention any two sources of waste.

Ans : SQP 2016

Domestic and industrial waste.

32. State the main objective of the treatment of gaseous waste.

Ans : COMP 2013

To minimize the generation of gaseous waste.

33. What is dumping ?

Ans : MAIN 2018

Dumping is an activity of depositing waste in an area.

34. What is composting ?

Ans : SQP 2016,2018

Composting is a biological process in which micro-organisms, mainly fungi and bacteria, convert degradable organic waste into humus-like substance.

35. State one source of gaseous waste.

Ans : COMP 2015

Vehicles.

36. Define Sewage.

Ans : MAIN 2017

The waste water discharge from domestic premises like residence, institutions and commercial establishments is known as sewage.

37. Name two diseases which occur because of waste accumulation on land.

Ans : MAIN 2003

Diarrhoea, Cholera

38. Name two common diseases caused as a result of gaseous pollution.

Ans : SQP 2004

Bronchitis and Asthama.

39. Name three water-borne diseases.

Ans : COMP 2005

Cholera, Typhoid and Dysentry

40. Name the disease caused by mercury contamination in japan.

Ans : MAIN 2006

Minamata Disease.

41. Name three monuments affected by Acid rain.

Ans : SQP 2007

Parthenon of Athens, the Colosseum of Rome, the Taj Mahal of Agra.

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63. Mention any one initiative taken by the Government to manage waste

Ans : MAIN 2023

One initiative taken by the government to manage waste is the Swachh Bharat Mission, which promotes cleanliness, encourages proper waste disposal and aims to eliminate open defecation and improve waste management across India.

64. What is Eutrophication ?

Ans : SQP 2017

Eutrophication is the process by which a body of water becomes enriched with high concentrations of nutrients, particularly phosphates and nitrates. This nutrient buildup leads to excessive growth of algae and aquatic plants, which can disrupt the balance of the aquatic ecosystem and cause oxygen depletion.

65. What was the cause of the following ?
(i) The Bhopal Tragedy.
(ii) The Minamata Disease.
(iii) The Chernobyl Disaster.

Ans : COMP 2013

(i) Bhopal Tragedy : Caused by the accidental release of methyl isocyanate (MIC) gas in 1984.
(ii) Minamata Disease : Caused by mercury poisoning due to industrial wastewater contamination in the 1950s.
(iii) Chernobyl Disaster : Caused by a nuclear reactor explosion in 1986, releasing radioactive materials.

66. What is recycling ?

Ans : SQP 2017

Recycling involves collecting and processing used materials to create new products, reducing waste in dustbins and helping to keep the environment cleaner with fresher air.

67. "Waste segregation is important". Give a reason to support your answer.

Ans : MAIN 2015

Waste segregation is important because it ensures that recyclable and biodegradable materials are separated from non-recyclable and hazardous waste, allowing for proper disposal, recycling and reducing environmental pollution.

68. Give two reasons as to why there is need for safe waste disposal.

Ans : SQP 2018

(i) Waste dumping spoils the area's landscape.
(ii) Dumping waste leads to diseases like diarrhea, malaria and plague.

69. What is biodegradable waste ? Give two examples.

Ans : COMP 2015,2016

Biodegradable waste refers to materials that decompose naturally in the soil, such as fruits and vegetables.

70. What is segregation?

Ans : SQP 2016,2018

Segregation involves separating waste into different categories based on the disposal method. The most common segregation is into biodegradable and non-biodegradable waste.

71. What can an individual do to reduce waste at home ?

Ans : MAIN 2019

An individual can reduce waste at home by using reusable items, composting kitchen waste and recycling materials properly. Avoiding single-use plastics and minimizing packaging also helps reduce waste.

72. How can waste be reused ? Explain with the help of an example.

Ans : COMP 2018,2022

(i) Waste can be reused by recycling; for instance, old newspapers and magazines can be recycled to produce reusable paper.

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(ii) Reuse helps in reducing the overall generation of waste.

73. Mention two ways in which the decomposition of waste in open areas can affect human health.

Ans : SQP 2019

(i) Open dump sites attract rodents, insects and vermin, posing health risks. Scrap tires at these sites create ideal breeding grounds for mosquitoes, which can multiply rapidly in stagnant water.
(ii) Burning solid waste releases harmful gases that can negatively impact the health of people living nearby.

74. Name two toxic particulate materials. State the effect of each on human health.

Ans : MAIN 2023

(i) Asbestos : Prolonged exposure can lead to lung diseases such as asbestosis, lung cancer and mesothelioma.
(ii) Lead : Inhalation or ingestion of lead particles can cause damage to the nervous system, kidney problems and developmental issues, particularly in children.

75. Give two advantages of dumping waste in sanitary landfill.

Ans : SQP 2015

(i) It avoids air pollution caused by burning waste.
(ii) Health risks are minimized as pests like flies and rats cannot breed due to the waste being covered.

76. What is composting ?

Ans : MAIN 2020

Composting is an aerobic process that decomposes organic waste into humus, called compost, which serves as an excellent fertilizer for plants.

77. Give two differences between toxic and nontoxic waste.

Ans : COMP 2000

Feature	**Toxic Waste**	**Non-toxic Waste**
Harmfulness	Contains harmful chemicals that pose risks to health and environment.	Not harmful and poses no significant threat to health or environment.
Disposal	Requires special handling and disposal to avoid contamination.	Can be disposed of through regular waste management methods.

78. Why is the handling of solid wastes a major problem?

Ans : SQP 2001

(i) Non-degradable Waste : Many solid wastes do not decompose and can cause large-scale pollution of land, soil, water and air, impacting the environment and ecology.
(ii) Health Hazards : Pollution from solid waste poses risks to human health, as well as to animal and plant life.
(iii) Soil and Water Contamination : Dumping solid waste deep into the ground can result in seepage of harmful substances into the soil and water through rainwater, spreading infection and contamination over large areas.

79. Name the gas produced by the decomposition of accumulated waste. Why is this gas harmful ?

Ans : COMP 2003

The gas produced by the decomposition of accumulated waste is methane (CH_4).
Methane is harmful because it is a potent greenhouse gas, contributing significantly to global warming. It is also flammable, posing a risk of explosions if it accumulates in enclosed areas.

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80. What is Global Warming ? Name any two Greenhouse Gases ?

Ans : MAIN 2004

Global Warming is the gradual increase in Earth's average temperature due to the accumulation of greenhouse gases in the atmosphere, which trap heat.
Two greenhouse gases are:
(i) Carbon dioxide (CO_2)
(ii) Methane (CH_4).

81. How does accumulation of waste affect animals and birds ?

Ans : SQP 2005

Scavengers and stray animals like dogs, rats, pigs and cows are directly impacted by waste when they feed on it. They sometimes ingest toxic materials or non-degradable substances like plastic bags, leading to choking and death. Consuming waste also exposes these animals to diseases and other health issues.

82. What impact does the decomposition of waste in the open areas have on human health ?

Ans : MAIN 2006

(i) Spread of Diseases : Decomposing waste attracts pests such as flies, mosquitoes and rodents, which can spread diseases like malaria, dengue and cholera.
(ii) Air and Water Pollution : Harmful gases and toxic chemicals released from decomposing waste can contaminate the air and water, leading to respiratory issues, skin problems and waterborne diseases in nearby populations.

83. How do solid wastes affect landscape ?

Ans : COMP 2007

Solid wastes spoil the landscape by:
(i) Ruining Aesthetic Value : They make the area visually unattractive.
(ii) Environmental Degradation : Waste leads to soil contamination and attracts pests, degrading the area.

84. Why are radioactive wastes more hazardous than other wastes ?

Ans : SQP 2008

Radioactive wastes are more hazardous than other wastes because they emit harmful radiation that can persist for thousands of years. This radiation can cause severe health issues, including cancer, genetic mutations and damage to organs and it contaminates air, water and soil, posing long-term risks to both humans and the environment.

85. What is known as the Minamata Disease ?

Ans : MAIN 2009

Minamata Disease is a neurological disorder caused by severe mercury poisoning. It was first discovered in Minamata, Japan, in the 1950, when industrial wastewater containing methylmercury was released into the sea. This toxic substance accumulated in fish and shellfish, which, when consumed by humans, led to symptoms such as muscle weakness, loss of vision and, in severe cases, paralysis and death.

86. What chemicals are used to make water totally free from micro-organisms ?

Ans : COMP 2010

Chlorine and ozone are commonly used chemicals to make water free from microorganisms. Additionally, ultraviolet (UV) radiation is also used as a disinfectant in some water treatment processes.

87. Give one example of reusing of waste.

Ans : SQP 2011

Some waste materials like old glass bottles, steel tyres and tin cans are reused. For example, old tyres are used to make shoes or chappals, leather is repurposed into water bags and tin cans are transformed into lamps, showcasing creative reuse of waste.

88. Why are recycled plastic bags considered harmful for environment ?

Ans : MAIN 2012

(i) Chemical Contaminants : They can leach harmful chemicals into soil and water during recycling.

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(ii) Dams can intensify natural disasters, such as earthquakes, leading to more severe damage.
(iii) In the event of an earthquake, the dam may crack, increasing the risk of flooding.
(iv) The aftermath of an earthquake may involve dealing with large broken pieces of the dam, compounding the disaster.

102. How are the people in the area affected by the construction of big dams ?

Ans : SQP 2001

(i) Environmental activists oppose the construction of big dams due to their negative impacts.
(ii) Large areas of forests and agricultural lands are submerged by water during dam construction.
(iii) These developments result in significant environmental damage, including habitat destruction.
(iv) The socio-economic consequences include the loss of livelihoods and displacement of communities.

THREE MARKS QUESTIONS

103. Explain how waste generated in following sectors may be made useful. (Give one example for each)
(i) Household
(ii) Industry
(iii) Agriculture

Ans : MAIN 2024

(i) Household : Household organic waste, such as kitchen scraps and vegetable peels, can be used to create compost, which enriches soil and supports gardening.
(ii) Industry : Waste materials like metal scraps can be recycled in the manufacturing sector to produce new products, reducing the need for raw materials.
(iii) Agriculture : Agricultural waste, such as crop residues and animal manure, can be converted into biogas or used as natural fertilizers to improve soil fertility and reduce the need for chemical fertilizers.

104. Briefly answer the following:
(i) How is segregation of the waste helpful?
(ii) Mention one way in which we can reuse waste.
(iii) Mention one benefit of Composting.

Ans : MAIN 2023

(i) Segregation of waste is helpful because it allows recyclable materials to be separated from non-recyclable ones, making waste management more efficient and reducing the amount of waste sent to landfills.
(ii) One way to reuse waste is by repurposing glass jars as storage containers instead of throwing them away.
(iii) One benefit of composting is that it produces nutrient-rich compost, which can improve soil fertility and reduce the need for chemical fertilizers.

105. Why is there a need for waste management in large metropolitan cities.

Ans : SQP 2022

The increasing waste is a result of rapid industrialization and urbanization.
(i) New types of waste, like packaging materials, are growing and domestic waste volumes are rising.
(ii) E-waste is increasing rapidly, with no proper handling methods in place.
(iii) These issues highlight the urgent need for waste management to ensure a livable environment for future generations.

106. What impact does the waste accumulation have on the following :
(i) Quality of air around us.
(ii) Quality of water around us.

Ans : COMP 2019

(i) Waste degrades air quality as solid waste releases methane and other harmful gases.
(ii) Toxic waste negatively impacts marine life and indirectly affects humans. When toxic waste is dumped into oceans, fish can ingest harmful chemicals, which may

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95. What do you mean by a scrubber ?

Ans : COMP 2019

A scrubber is a device that uses a spray of water to capture pollutants during emissions. In this process, water is introduced into a spray tower through a nozzle, allowing it to flow downwards. As the polluted gas rises, the particulates in the gas collide with the water droplets from the nozzles. Under the influence of gravity, the liquid droplets containing the particulates settle at the bottom.

96. Explain clearly how the waste can be reduced by changing the process of production.

Ans : MAIN 2020

Waste can be reduced in production by:

(i) Improving Efficiency : Optimizing techniques and machinery to minimize resource use.

(ii) Material Substitution : Using sustainable materials, like biodegradable options instead of plastics.

(iii) Process Redesign : Implementing closed-loop systems for material reuse.

(iv) Reducing Packaging : Minimizing packaging materials and using recyclable options.

(v) Conducting Waste Audits : Identifying waste sources for targeted reduction.

(vi) Employee Training : Educating staff on waste reduction practices.

97. Why should we avoid using polythene carry bags and styrofoam cups ?

Ans : SQP 2021

We should avoid using polythene carry bags and styrofoam cups because:

(i) Environmental Impact : Both materials are non-biodegradable and can take hundreds of years to decompose, contributing to landfill waste and environmental pollution.

(ii) Harm to Wildlife : Animals often mistake these items for food, leading to ingestion that can cause harm or death.

(iii) Chemical Leaching : Styrofoam can release harmful chemicals into food and beverages, posing health risks to humans.

(iv) Resource Intensive : The production of polythene and styrofoam requires significant energy and resources, contributing to carbon emissions.

98. What service is indirectly done by the rag-pickers for the disposal of waste?

Ans : COMP 2022

In India, numerous impoverished garbage collectors sustain themselves by gathering discarded materials. These individuals play a vital role in removing large quantities of waste from landfills. They recover items such as metal, glass, rubber and plastics, which are then recycled to create new finished products.

99. Explain the role of segregation of waste in the safe disposal of waste.

Ans : MAIN 2023

In industrialized countries like Japan, waste is segregated prior to disposal. In residential areas, different bins are used to separate materials such as glass, metals, paper and cloth. Each type is then handled individually, either through reuse, recycling, or other accepted waste disposal methods.

100. What is meant by Environmental Impact Assessment ?

Ans : SQP 2018

To reduce the negative environmental impact of various developmental projects, such as the construction of large dams, railways, flyovers, canals and highways, the government mandates that an Environmental Impact Assessment (EIA) be conducted before the commencement of these projects. This ensures that potential environmental effects are evaluated and addressed in advance.

101. What harm is done to the environment by building big dams ?

Ans : MAIN 2000

(i) Building a big dam disrupts the river ecosystem and harms both aquatic and terrestrial life.

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harmful ultraviolet (UV) radiation from the sun.

Harmful effects :

(i) Increased UV radiation : Depletion allows more UV rays to reach the Earth's surface, leading to higher risks of skin cancer, cataracts and other health issues.

(ii) Damage to ecosystems : Increased UV exposure can harm marine ecosystems, especially plankton and affect plant growth.

(iii) Impact on agriculture : UV radiation can reduce crop yields and damage sensitive crops.

(iv) Degradation of materials : UV rays can cause faster degradation of materials like plastics and rubber.

113. What is E-waste ? Why is it increasing at a fast rate ?

Ans : MAIN 2007

E-waste refers to discarded electronic devices and components, such as computers, mobile phones, televisions and other electronic appliances.

E-waste is increasing rapidly due to:

(i) Technological advancements : Frequent upgrades in technology lead to shorter product lifecycles, resulting in faster disposal of old devices.

(ii) Increased consumption : The growing demand for electronic gadgets, driven by consumerism and convenience, leads to a higher volume of electronic waste.

(iii) Lack of proper recycling : In many areas, there are insufficient recycling programs, leading to a build-up of discarded electronics.

114. Explain briefly how does the industrial waste reach the human beings and affect their health.

Ans : SQP 2008

The buildup of solid waste is unsightly, emits unpleasant odors and attracts insects, rats and other animals that can spread diseases. Open burning of waste in dump yards generates smoke and foul-smelling air. Additionally, rainwater can permeate the refuse, transporting harmful substances to various locations.

Sanitary landfills are unsuitable for human settlements because they release methane and carbon dioxide gases within the first two years. These gases are produced as solid waste begins to decompose underground.

115. Explain how eutrophication affects aquatic life.

Ans : COMP 2009

Eutrophication is the process where oxygen is depleted from water bodies, either naturally or due to human activities. It occurs when nutrients and chemicals enter the water through domestic sewage, industrial effluents and agricultural fertilizers. Algae and phytoplankton use carbon dioxide, inorganic nitrogen and phosphates as nutrients, serving as food for zooplankton. Small fish feed on these zooplankton and larger fish consume the small fish. When excessive nutrients from waste lead to the overgrowth of phytoplankton and algae, the penetration of oxygen, light and heat into the water is reduced. This results in the death of most aquatic organisms, leaving the water devoid of oxygen.

116. What harm is done by dumping of waste near water bodies?

Ans : MAIN 2003

Dumping waste near water sources allows contaminants to seep through the soil into water bodies. Direct disposal of untreated waste in rivers, seas and lakes leads to the accumulation of toxic substances in the food chain through plants and animals, a process known as biomagnification. Solid waste clogging drains and gully pits causes waterlogging, especially during the rainy season. This stagnant water becomes a breeding ground for mosquitoes, spreading diseases like malaria and chikungunya.

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cause food poisoning when consumed by humans.

107. Mention some benefits of composting.

Ans : MAIN 2022

Benefits of composting are as follows :
(i) It provides essential nutrients for plant growth.
(ii) It helps mitigate the harmful effects of excessive alkalinity, acidity, or overuse of chemical fertilizers.
(iii) It improves soil texture, making it easier to cultivate.
(iv) It regulates soil temperature, keeping it cool in summer and warm in winter and prevents erosion by keeping the soil covered.
(v) It helps control weed growth in gardens.

108. Give a reason for each of the following :
(i) Trees must be planted in the industrial area.
(ii) Chemical fertilizers must be replaced by organic manure.
(iii) Plastic and polythene products must be banned.

Ans : SQP 2019

(i) Trees absorb carbon dioxide and release oxygen, improving air quality and reducing pollution.
(ii) Organic fertilizer improves soil health, retains water and makes cultivation easier, making it especially beneficial for growing vegetables compared to chemical fertilizers.
(iii) Plastic and polythene are non-biodegradable, meaning they do not decompose in the soil, leading to long-term environmental pollution.

109. What is waste ? Name two sources of waste.

Ans : COMP 2003

Waste refers to any unwanted or discarded material that is no longer useful or has no further use.
Two sources of waste are :
(i) Domestic Waste : Generated from households, including food scraps, packaging and plastics.
(ii) Industrial Waste : Produced by factories and industries, including chemicals, metal scraps and byproducts of manufacturing processes.

110. How is the 'use and throw' concept responsible for the increase in waste generation ?

Ans : MAIN 2004

The 'use and throw' concept is responsible for increased waste generation because it encourages the rapid consumption and disposal of products. Items like single-use plastics, disposable packaging and cheap, short-lived goods are discarded after minimal use, leading to a higher volume of waste. This mindset reduces the emphasis on reuse or recycling, contributing significantly to waste accumulation and environmental pollution.

111. What is acid rain ? State its impact on the environment.

Ans : SQP 2005

Acid rain is rainfall containing acidic compounds like sulfur dioxide (SO_2) and nitrogen oxides (NOx), produced by burning fossil fuels.
Impact on the environment :
(i) Aquatic life : Lowers pH of water bodies, harming fish and aquatic organisms.
(ii) Soil degradation : Depletes nutrients, affecting plant growth.
(iii) Vegetation damage : Weakens trees, making them vulnerable to disease.
(iv) Erosion of structures : Corrodes buildings and monuments, especially those made of limestone or marble.

112. What is meant by Ozone layer depletion ? How is it harmful ?

Ans : COMP 2006

Ozone layer depletion refers to the thinning of the ozone layer in the Earth's stratosphere, primarily caused by the release of chemicals like chlorofluorocarbons (CFCs), halons and other ozone-depleting substances. The ozone layer protects life on Earth by absorbing

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of epidemics.

(ii) Toxins present in waste can directly kill aquatic organisms by significantly altering the water's pH levels, covering the water surface and reducing the amount of dissolved oxygen.

(iii) Birds that feed on agricultural waste are at risk of extinction because consuming toxins from the waste leads to thinner and weaker eggshells and increased mortality rates.

121. What do you mean by segregation of waste? How does it ensure safe waste disposal ?

Ans : SQP 2015

Segregation of waste refers to the process of separating waste into different categories, such as biodegradable, recyclable, non-recyclable and hazardous waste, based on their disposal method and potential impact.

Safe waste disposal can be ensured by :

(i) Efficient Recycling : By separating recyclable materials, segregation enables more efficient recycling, reducing the amount of waste that ends up in landfills.

(ii) Prevents Contamination : Hazardous waste is kept separate from regular waste, preventing harmful substances from contaminating soil, water, or air.

(iii) Proper Treatment: Different types of waste can be treated or disposed of in ways that minimize environmental impact, ensuring safe disposal and reducing pollution.

(iv) Promotes Composting: Organic waste can be composted separately, reducing landfill burden and returning nutrients to the soil.

122. What is meant by open dumping of waste ? Why is open dumping not considered as an environment friendly method ?

Ans : COMP 2016

Open dumping of waste refers to the practice of disposing of waste in uncovered, unregulated areas without proper treatment or containment. Open dumping not considered as an environment friendly method because of

(i) Pollution : Open dumps can contaminate air, soil and water through leaching of harmful chemicals and the release of toxic gases

(ii) Health Hazards : They attract pests, such as rodents and insects, that spread diseases.

(iii) Unpleasant Odors : The decomposition of waste produces foul smells that affect nearby communities.

(iv) Harm to Wildlife : Animals can ingest or get trapped in the waste, leading to injury or death.

123. Give a reason for each of the following:

(i) Vehicles used for transporting waste should be covered.

(ii) Waste segregation is key to waste management.

(iii) Roads from plastic waste are environment friendly.

Ans : MAIN 2017

(i) Vehicles used for transporting waste should be covered to prevent waste from spilling or blowing away, which can cause littering, environmental pollution and health hazards by spreading harmful pathogens or attracting pests. Covering also helps control foul odors.

(ii) Waste segregation is key to waste management as it allows different types of waste, such as biodegradable, recyclable and hazardous materials to be handled appropriately. This enables recycling, composting and safe disposal, reducing the overall waste sent to landfills and minimizing environmental harm.

(iii) Roads made from plastic waste are environmentally friendly because they recycle non-biodegradable plastics, reducing landfill waste and pollution. Additionally, plastic roads are more durable, cutting down on maintenance costs, while promoting sustainable reuse of materials.

124. (i) What is a sanitary landfill ?

(ii) How is waste disposed of in a sanitary landfill ?

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117. Give a geographical reason for each of the following :
(i) Marine animals and turtles are found dead in many coastal areas.
(ii) Radioactive waste is more harmful than other waste.
(iii) Uncontrolled burning of waste causes air pollution.

Ans : SQP 2011

(i) Marine turtles are vulnerable to the effects of consuming marine debris because their downward-facing spines hinder their ability to regurgitate ingested materials. Additionally, oil drilling poses a threat to marine life by causing pollution through oil spills, which harm various marine animals.
(ii) Radioactive waste, generated from nuclear power reactors, is highly dangerous due to its composition of radioactive substances such as beta and gamma emitters and actinides that release alpha particles, including uranium-234, neptunium-237, plutonium-238 and americium-241. These radioactive compounds are harmful because they take many years to naturally decompose. Exposure to radioactive waste can cause mutations, leading to severe health and environmental consequences.
(iii) Uncontrolled burning of accumulated waste produces smoke and other air pollutants that release toxic substances into the environment, resulting in significant air pollution.

118. What is bio-magnification ? What can be its effects on humans ?

Ans : COMP 2012

Bio-magnification is the process by which the concentration of toxic substances, such as pesticides or heavy metals, increases as they move up the food chain. These toxins accumulate in the tissues of organisms, becoming more concentrated at each higher trophic level.
Effects on humans :
(i) Health issues : Consuming contaminated food can lead to cancer, liver and kidney damage and neurological disorders.
(ii) Reproductive issues : Toxins can disrupt hormones, causing birth defects or infertility.
(iii) Impaired immune system : Long-term exposure to toxins can weaken the immune system, increasing susceptibility to diseases.

119. Explain briefly the need for management of waste.

Ans : SQP 2013

Nature has been recycling waste materials for millions of years. However, the rapid growth of the human population over the past century has threatened the environment through our activities and the waste they generate. Significant harm is caused to the environment by air pollution, soil degradation and the contamination of water sources like rivers and lakes.
If we do not use our resources wisely and reduce waste, our survival will be at risk. Waste leads to pollution, which in turn causes environmental damage. Therefore, effective waste management is urgently necessary.

120. Give a reason for each of the following :
(i) 'Use and throw' concept generates more waste.
(ii) Run off from fields leads to death in adjacent water-bodies.
(iii) Birds feeding on agricultural waste are at the brink of extinction.

Ans : MAIN 2014

(i) The "use and throw" mentality has drastically increased both the volume and complexity of waste produced. Large piles of solid waste are commonly seen on street corners, around hospitals, schoolyards and even near water bodies. Disposing of solid waste in this manner not only creates an unsightly environment and emits foul odors but also poses serious health risks. In some instances, the accumulation of waste, particularly near water sources, can lead to outbreaks

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128. Give a reason for the following :
(i) plant more trees.
(ii) use organic manure instead of chemical fertilizers.
(iii) use mass transport system.

Ans : COMP 2022

(i) Plant more trees to absorb carbon dioxide, release oxygen and improve air quality, while also providing habitats for wildlife and preventing soil erosion.
(ii) Use organic manure instead of chemical fertilizers to enhance soil health naturally, reduce soil degradation and minimize the risk of water pollution from chemical runo
(iii) Use mass transport systems to reduce traffic congestion, lower greenhouse gas emissions and decrease air pollution, making urban environments more sustainable and energy-efficient.

129. Name the processes involved in reducing the waste.

Ans : MAIN 2002

The processes involved in reducing waste are:
(i) Reduce : Minimizing the amount of waste generated by using fewer resources and avoiding unnecessary products.
(ii) Reuse : Extending the life of items by using them multiple times or repurposing them for different functions.
(iii) Recycle : Processing waste materials into new, useful products, reducing the need for raw materials and energy.
(iv) Composting : Decomposing organic waste to create nutrient-rich compost for use in gardening and agriculture.
(v) Waste Segregation : Separating waste into categories such as biodegradable, recyclable and hazardous, to ensure proper treatment and disposal.

130. Give three examples to show how social initiatives can help minimize the use of resources.

Ans : MAIN 2016

The Role of Society in Maintaining Environmental Standards
(i) Advocating for Clean Air and Water : When the air and water quality in a region fall below acceptable standards, local residents can unite and pressure the responsible agencies to take necessary corrective actions.
(ii) Taking Legal Action through Public Interest Litigation (PIL) : If appropriate measures are not implemented, community members can file a Public Interest Litigation (PIL) under existing laws to address and resolve their environmental issues.
(iii) Individual Responsibility for Environmental Protection : Since society is composed of individuals, each person has a duty to ensure that their actions do not contribute to environmental pollution.

131. Explain the role of government in waste management.

Ans : SQP 2000

In India, the Ministry of Environment and Forests is the primary agency responsible for raising environmental awareness and creating and enforcing environmental protection schemes. The government's environmental policy emphasizes the following areas:
(i) Controlling land and water degradation through programs such as Wasteland Management and Restoration of river water quality.
(ii) Conserving natural resources by designating areas as reserved forests, biosphere reserves, wetlands, mangroves and protecting endangered species.
(iii) Monitoring development for environmental protection and enforcing penalties for violations of environmental laws.

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132. What can an individual do to reduce waste at home as well as in the office?

Ans : MAIN 2001

An individual can reduce waste both at home and in the office by:

Ans : SQP 2018

(i) A sanitary landfill is a method of waste disposal in which refuse is carefully managed and placed on land without causing public health risks or environmental hazards. It is designed to prevent nuisances such as odor, pests and pollution.

(ii) The sanitary landfill system for waste disposal is primarily a biological process that occurs in five phases :

(a) In the first phase, aerobic bacteria consume the available oxygen, causing a rise in temperature.

(b) During the second phase, anaerobic conditions develop, leading to the release of hydrogen and carbon dioxide.

(c) In the third phase, bacterial populations grow and methanogenic activity begins, producing methane from the breakdown of organic matter.

(d) The fourth phase sees the stabilization of methanogenic activity.

(e) In the fifth phase, organic matter is depleted and the system gradually shifts back to an aerobic state.

125. Give a reason for each of the following :

(i) Recycling of waste to produce paper can reduce deforestation.

(ii) Sugarcane waste can be recycled into useful products.

(iii) We should avoid using polythene carry bags.

Ans : COMP 2019

(i) Bagasse can be employed in the production of paper pulp, thereby conserving trees that are typically harvested for this purpose.

(ii) During the sugarcane season, large quantities of bagasse are generated. This bagasse can be utilized to produce paper pulp, reducing the need to cut down trees for paper manufacturing. Additionally, bagasse is used to create packaging materials for dairy products. The paper industry also recycles materials such as wood, cloth and used paper to further minimize environmental impact.

(iii) We should refrain from using polythene carry bags because the melting of plastics and plastic products breaks down polymer chains into smaller, harmful units.

126. State three steps that should be taken by the municipal authorities for the safe disposal of solid waste.

Ans : MAIN 2020

(i) Waste Segregation : Implement proper segregation of waste at the source into categories like biodegradable, recyclable and hazardous waste to ensure efficient recycling and disposal.

(ii) Sanitary Landfills : Establish and maintain sanitary landfills with protective liners and covers to prevent contamination of soil and groundwater and manage waste decomposition in an environmentally safe manner.

(iii) Waste Recycling and Composting : Promote recycling programs for materials like plastics, paper and metals and encourage composting of organic waste to reduce the amount of waste sent to landfills and support resource recovery.

127. What is composting ? Give two advantages of using compost.

Ans : SQP 2021

Composting is the process of decomposing organic waste, such as food scraps, leaves and plant material, into a nutrient-rich substance called compost, which can be used as a natural fertilizer.

Two advantages of using compost:

(i) Improves soil fertility: Compost enriches the soil with essential nutrients, promoting healthy plant growth and improving soil structure.

(ii) Reduces landfill waste: Composting organic waste reduces the amount of waste sent to landfills, decreasing methane emissions and contributing to environmental sustainability.

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(ii) Microplastic Pollution : They may break down into microplastics, which accumulate in ecosystems and enter the food chain.
(iii) Energy Consumption : The recycling process requires significant energy, contributing to carbon emissions.
(iv) Low Recycling Rates : Many plastic bags are not recyclable and often end up in landfills or oceans, causing long-term environmental harm.

89. What is biodegradable waste ? Name two useful products which can be made from biodegradable domestic waste.

Ans : COMP 2013

Biodegradable waste refers to organic materials that can be broken down naturally by microorganisms into non-toxic substances, returning nutrients to the soil.
Two useful products that can be made from biodegradable domestic waste are :
(i) Compost : A nutrient-rich soil amendment used for gardening and agriculture.
(ii) Biogas : A renewable energy source produced through anaerobic digestion, which can be used for cooking and heating.

90. What service is indirectly done by the rag-pickers for the disposal of waste?

Ans : MAIN 2014

In India, poor garbage collectors earn a livelihood by collecting discarded solids, effectively removing a significant portion of waste from garbage dumps. They salvage materials such as metal, glass, rubber and plastics, which can be recycled into finished products, contributing positively to waste management and resource recovery.

91. What are the three R's of waste management?

Ans : COMP 2015

(i) Reduce : Minimize the amount of waste generated by consuming less and choosing products with less packaging.
(ii) Reuse : Find new ways to use items instead of throwing them away, thereby extending their life.
(iii) Recycle : Process used materials to create new products, reducing the need for raw materials and energy consumption.

92. What is meant by recycling of waste effectively? Give one example.

Ans : SQP 2016

Recycling of waste effectively means collecting and processing used materials into new products while maximizing resource recovery and minimizing environmental impact.
Example : Recycling plastic bottles into polyester fibers for clothing or insulation reduces the need for new plastic production and minimizes landfill waste.

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93. Explain how reusing waste can reduce the burden of waste disposal.

Ans : MAIN 2017

Many waste collectors traverse residential areas and industrial sites to gather solid waste. They sort the materials and supply them to skilled artisans who create utility items from these resources, earning a livelihood through their craft. For instance, Nek Chand has created a stunning garden in Chandigarh using waste products such as tin cans, bottles and broken crockery. Thus, waste collectors play a crucial role in facilitating new production processes, helping to reduce the burden of waste disposal.

94. Why is the activated sludge so called ?

Ans : SQP 2018

The microorganisms in the sludge break down the organic matter in the wastewater from the primary treatment tank, effectively reducing the Biological Oxygen Demand (BOD) to an acceptable low level. After this process, the water exits the aeration tank along with the suspended biomass, which contains organic matter. A portion of this biomass is reused to consume additional organic matter from the wastewater, which is why it is referred to as "activated sludge."

(i) At Home :
1. Composting : Turn kitchen waste like vegetable peels and food scraps into compost.
2. Use Reusables : Opt for reusable items like cloth bags, containers and water bottles instead of disposables.
3. Avoid Single-Use Plastics : Minimize the use of plastic bags, straws and packaging.
4. Recycle Properly : Separate recyclable materials such as paper, glass and plastic for proper recycling.

(ii) In the Office :
1. Go Paperless : Use digital documents and emails instead of printing paper.
2. Reuse Office Supplies : Reuse items like paper clips, folders and envelopes.
3. Conserve Resources : Be mindful of energy use and switch off electronic devices when not in use.
4. Encourage Recycling : Set up recycling bins for paper, plastic and e-waste within the office space.

133. Explain the effects of agricultural waste.

Ans : SQP 2003

(i) Agricultural activities produce a significant amount of waste. While most agricultural waste is biodegradable, improper management often leads to negative environmental impacts.

(ii) After harvesting, crop residue forms the bulk of agricultural waste. Farmers commonly burn this residue in the fields, which destroys essential organic matter in the soil.

(iii) The ash released from burning floats in the air, posing health risks to people. Threshing also produces straw waste, with particles that remain airborne, particularly affecting individuals with asthma. Additionally, dairy farming contributes to unpleasant odors in the air.

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